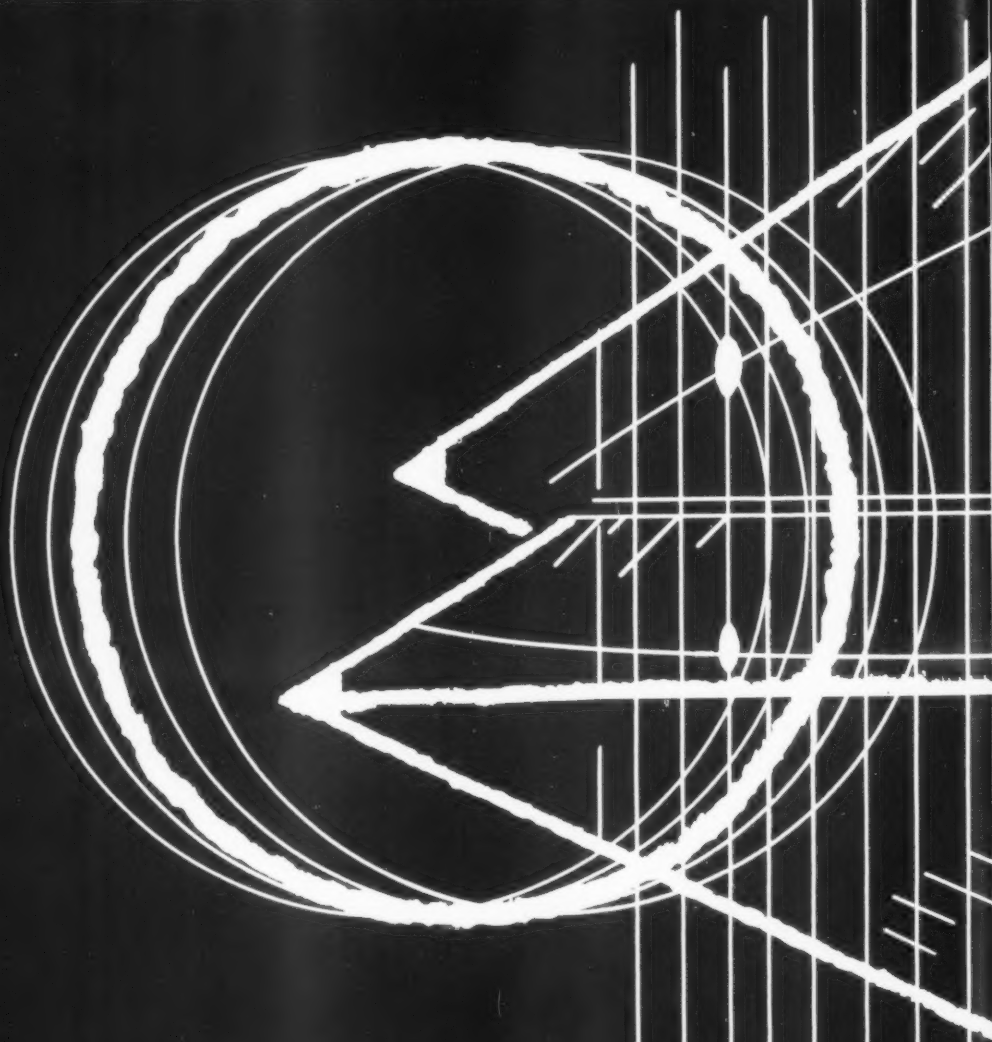
approach

NAVWEPS 00-75-510 THE NAVAL AVIATION SAFETY REVIEW JANUARY 1962

'What do we do now?'

Approach to Minimums?



'Reliable air operations are essential to readiness'

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Although possession of an instrument card authorizes a naval aviator to operate his aircraft under almost all instrument conditions, it should not arbitrarily be used as a "carte blanche" in deciding to takeoff, or make an approach.

Besides maintaining a certain level of instrument proficiency, each pilot is expected to use common sense and mature judgment in considering safety, necessity or urgency of mission, aircraft capability, personal capabilities, facilities and forecast weather.

There are numerous accidents on record at the Safety Center which never would have occurred if the pilot had made an objective appraisal of the situation and had asked himself, "Is this flight or is this approach really necessary?"

In cases where the answer was yes, certain accidents could still have been prevented if the "mature judgment" of the pilot had dictated proceeding to an alternate when destination weather went below minimums. Unfortunately this is not always the situation. Accidents will continue to occur as long as pilots insist on shooting minimum and below minimum approaches *when necessity does not demand it.*

What is a minimum approach?

In the case of ILS and PAR approaches, which have the lowest landing minimums, a minimum approach to a predetermined ceiling and visibility minimum is based on several criteria—surrounding terrain, length of runway, obstacles within a certain distance of approach track, missed approach track and capability of the radar, to mention a few. Most air stations that have a GCA unit have either 200′ and ½ mile or 100′ and ¼ mile minimums depending on the criteria mentioned above. As such, a GCA down to these minimums is very definitely a precision maneuver, for reasons previously discussed in "Request GCA," APPROACH, January 1959.

It is the events which take place subsequent to the time that minimums are reached which cause accidents. OpNav Inst 3721.1C is very clear as to what action is necessary at this point. It states that all pilots will level off when the facility's ceiling minimum has been reached unless the pilot has the runway in sight. OpNav Inst 3720.2A further limits single-piloted aircraft to an absolute minimum of 200′ and ½-mile visibility for an ILS or PAR.

Thus, *even though the field minimums may be 100′ and ¼-mile for a PAR approach,* the single-piloted airplane driver is required to level off at

On every instrument approach there are two minimums—ceiling and visibility. Unless the runway is in sight at the visibility minimum a missed approach is mandatory.

by LCDR R.A. Eldridge

200′. After the ceiling minimum has been reached there is a second minimum both legal and practical —visibility. The instruction states: "All aircraft, upon reaching visibility minimum, shall execute a missed approach unless the landing area is in sight and a visual landing can be effected."

This brings up a very important consideration concerning the weather which has been transmitted to the pilot prior to his commencing the approach. If the ceiling has been given as 300′ and the minimum of the field is 200′ he is likely to be optimistic about breaking out and spotting the runway. Thus when he gets to the 200′ minimum and still does not have the runway in sight, although leveling off is the only correct action, he has been conditioned that the runway will appear and he eases down a bit lower. At this point his flight is just an accident looking for a place to happen!

Here's just such an accident. Two F4Ds were recalled from an all-weather intercept training mission because of rapidly deteriorating weather. At this time the weather was reported as obscured with 2½ miles visibility. The flight leader commenced his GCA and entered fog 1¼ miles from the runway at 700 feet. He continued to approach until the controller told him to wave off at which time he was at 350 feet.

The second *Ford* pilot was performing his GCA from a 5-mile trail position astern of his section leader. GCA informed him "the weather down here is patchy fog laying in right at the end of the runway at this time." Later in the approach he was advised by GCA "your playmate is executing a missed approach. Do you want to continue your approach, over?" To this he replied, "Affirm, I'll try."

His approach was normal until he was advised that he was at minimums. At this point he was observed dropping rapidly below the glide path and turning to the right. The F4D struck an approach light pole and subsequently crashed. The pilot did not survive.

The accident board stated that the pilot knew his responsibilities and the necessity for executing a missed approach when informed that he was at minimums. Therefore, they concluded that when the pilot continued his approach he mistook the approach lights for runway lights and believed he had the runway in sight.

In retrospect it was determined that the field was actually below minimums when the pilot commenced his approach. Unfortunately there was an excessive delay in the weather observation and reporting procedures that prevented the pilot from being informed of the actual weather. Twenty-four minutes before the accident the visibility was recorded at 2½ miles; two minutes later it was observed to have decreased to ½-mile. Yet despite this deteriorating condition no further observation was taken for an 18-minute interval. At this time the weather was logged as "zero-zero,' This was four minutes before the pilot crashed.

The accident board stated: "With the knowledge that an aircraft was attempting an approach under such weather conditions, and having cleared him to land, tower personnel should have informed the pilot as expeditiously as possible. Instead three attempts were made to inform GCA by intercom of the zero-zero condition, which still required further relay to the pilot. The lack of actual weather information definitely placed the pilot at an unsuspected disadvantage."

One of the recommendations made by the accident board was that "Particular emphasis should

An instrument approach must of necessity be terminated by a visual landing.

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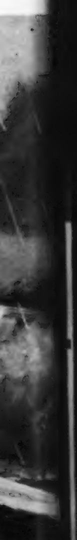

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Under conditions necessitating an instrument approach to minimums it is imperative that every effort be made to inform the pilot of the current weather at the landing end of the runway.

be placed on procedures which will provide continuous weather observations during periods of rapid weather deterioration." Some units place a qualified weather observer in the tower when traffic is expected under such conditions.

The important consideration is not so much why pilots fail to execute a missed approach but rather that they do fail to do so. Sometimes the results are tragic. Take the following GCA of a WV-2 as an example.

On his first approach the pilot was informed that he was approaching GCA minimums, going below the glide path and subsequently ordered to take a waveoff. *In the process of taking the waveoff the aircraft actually touched the runway.*

As the pilot prepared for a second GCA he was

informed that the weather was now an "indefinite 100′ sky obscured 1 mile light drizzle with fog." (The GCA minimums for the field were 200′ and ¼-mile and had just been given to the pilot.) Thus at this point the field was below GCA minimums, but there was no directive which required the pilot to proceed to his alternate or another suitable airfield with better weather.

Therefore, another approach was commenced. It was a good approach until minimums were again reached at which time the aircraft dropped rapidly below the glide path and crashed into the water. Eleven men were fatally injured with eighteen others sustaining injuries of a lesser degree.

OpNav Inst. 3720.2A is the present bible on instrument flight requirements, qualifications and procedures. Paragraph 2b of Section III (Clearance Procedures) states: "Except in an emergency, instrument approaches in reciprocating engine type aircraft shall not be commenced when the reported weather is below the minimums prescribed in paragraph 3a below *unless it has been determined* that the aircraft has the capability to proceed to an alternate airport in the event a missed approach must be executed. . . ."

Although it is believed that the intent of this particular paragraph was to prevent pilots of reciprocating engine aircraft from commencing approaches when the field was below minimums, it doesn't do so in actual interpretation. The phrase which begins "unless it has been determined . . ." will not prevent any reciprocating pilot from commencing an instrument approach no matter what the weather is. Why? Because each pilot when filing IFR to a destination and signing his DD-175 ascertains that he has sufficient fuel to get to his destination, shoot an approach and then proceed to his alternate, with a 10 percent reserve upon arrival at the alternate.

There is an oft uttered remark attributed to pilots to the effect that "If the weather isn't so good when we get there we can always shoot an approach and then go to our alternate if we can't get in." This philosophy may sound very good but it doesn't always work in actual application.

Let's take a look at an AD-5 fatal accident which illustrates some of these considerations.

The Approach Control Center serving the destination airport relayed the existing weather to the pilot—indefinite, 100′ obscuration and ⅜-mile visibility in fog. Since the field's GCA minimums were 200 and ½ the field was already below minimums. However, the pilot commenced his first approach. He was waved off at precision minimums for being too far above the glide path. After executing his missed approach he received clearance for another approach.

As he reached a point 5 miles from the end of the runway the controller informed the pilot ". . . for your information the weather has deteriorated. You have an indefinite zero with 3/16th of a mile. . . ." This transmission was acknowledged but the approach was continued. It appeared to be normal until one mile from the end of the runway when the pilot was informed that he was approaching precision minimums. At this point he started dropping below the glide path and drifting to the right. The GCA controller gave a waveoff but the aircraft crashed short of the runway.

The AAR board was of the opinion that the pilot had exercised poor judgment in filing a flight plan to a destination when the existing and forecast weather was below GCA minimums. In electing to make a second GCA when the existing weather had deteriorated to a ceiling zero and 3/16th mile visibility he further compounded his error of judgment—no doubt influenced by personal considerations to get to this particular destination—and left himself no margin for error.

One of the endorsements stated ". . . this accident could possibly have been avoided if there was some way that the GCA controller could have required the pilot to proceed to his alternate when the first approach was missed and when the weather deteriorated to practically zero-zero."

Another endorser had this to say about the accident. "This particular case raises one pertinent question: If the pilot is supposed to waveoff at 200 feet and ½-mile, which is the GCA ceiling and visibility minimums at the field, why did the GCA controller let him continue a second pass after having received information that the weather had deteriorated to indefinite zero obscured and 3/16 mile visibility? It seems that this only encourages a pilot to violate a published instruction."

It is realized, however, that *nothing in our present directives authorizes a GCA controller to require a pilot to proceed to his alternate.* In fact, although the controller notifies the pilot when he is at minimums he shall continue to issue approach instructions until the theoretical touchdown point has been reached, unless he orders a missed approach for exceeding any of the following position limits:

1. Any time the observed flight path deviates in either azimuth or elevation to the extent that a safe approach or landing is questionable.

2. If any rapid or radical deviation with respect to the approach path is observed during the last one mile of the approach.

3. The safe limit established by waveoff cursors, where applicable, is exceeded.

A P2V sustained substantial damage as the result of a hard landing at the destination airport. In analyzing the accident it was pointed out that the Operations Duty Officer should never have approved the flight plan since the destination was below minimums and forecast to remain so. There-

fore, according to the provisions of OpNav Inst. 3720.2A the pilot was not authorized to take off. When questioned the pilot stated that "it slipped his mind" that he was not conforming to regs.

This brings up an interesting point for discussion concerning the manner in which OpNav Inst. 3720.2A is written. When the destination airport is forecast to be below the minimums listed on page 5 of that instruction *a pilot is not authorized to file for that airport.* Yet assuming that a pilot of a reciprocating engine aircraft is authorized to file IFR for a particular destination, and upon arrival finds that the weather has deteriorated to below approach minimums, it would seem logical that he would not be authorized to commence an approach. But as mentioned earier in this article this is not the case. Authorization is granted to a pilot to *commence* an approach even if the field is zero-zero.

It is realized that there are numerous pilots flying today who are accustomed to making instrument approaches to landing minimum as a matter of routine.

These are the pilots whose flight proficiency is very high because of the high number of hours flown each month and their exposure to instrument flying and instrument approaches. Naturally one would expect a line pilot in an air transport squadron to be more proficient in making instrument approaches than the proficiency pilot who flies once or twice a month.

However, in authorizing naval aviators to fly on instruments it was not CNO's intent that every aviator should avail himself of the opportunity to shoot a minimum approach whenever the situation presents itself. Attempting to define just when an aviator should and should not do this is equally as difficult as trying to find the correct answer for any other controversial subject. There is no all inclusive correct answer. But certainly the following should be of paramount consideration by the pilot before he attempts such an approach:

1. Necessity or urgency for landing at that particular field.
2. Availability and time required to reach an alternate with considerably better weather.
3. Fuel remaining.
4. Pilot's own proficiency for executing an approach to minimums.
5. Reliability of and time since last weather observation was taken.
6. Reliability of communications equipment.
7. Ascertaining that he has correct altimeter setting.

For years all naval aviators have been required to maintain a valid instrument card, and to fly a specified amount of their yearly flight time on instruments—either actual or simulated. In addition to meeting these and other minimum requirements, each aviator is required annually to demonstrate his knowledge of instrument procedures and ability to fly instruments by satisfactorily passing an instrument flight check. If everything is satisfactory his card is renewed.

In summation, shooting a precision radar approach to field minimums can be likened to a perfect play in football—everything has to be perfectly executed to succeed. ●

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RADM W. O. Burch, Jr. Commander, NASC

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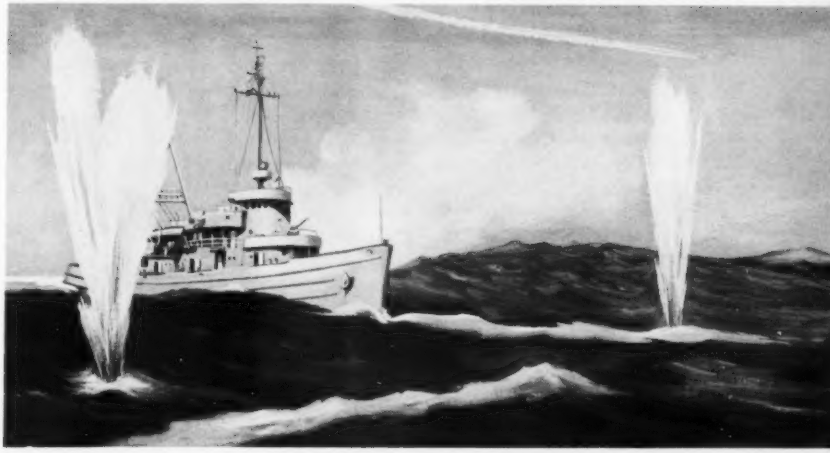


SAFETY REQUIREMENTS FOR BOMBING EXERCISES

There have been sufficient numbers of occurrences in the past of high altitude practice bombings of wrong targets due to mistaken target identity to indicate that in these cases the observance of certain basic factors of safety have been disregarded or not recognized.

Prior to a recent bombing demonstration at sea, inadequate planning for target identification by the bombing aircraft crew resulted in a near tragedy. The briefing procedures within the ship, the Carrier Air Group and the Heavy Attack Squadron were inadequate and omitted any requirement for positive surface radar control of the bomber.

Reliance was placed on visual control of the bomber by an airborne observer which proved to be ineffective in contrast to the control accuracy of radar which was available in the ship's CIC. The preflight briefing included a requirement for aircrew optical verification of the aircraft's radar plot of the target. During the bombing run this cross-check was not made due to malfunction of the aircraft's optical bombing system. Noncompliance with this safety precaution should have precluded authorization to drop. Two 500-pound bombs were released and hit close to the "target" which in this case was the tug boat for the real target and was well clear of the area of intended bombing.

The Officer in Charge of the Exercise (OCE) shall insure that the planning for high altitude bombing exercises include:

a. Full understanding by the pilot of each bomber aircraft of his responsibility with regard to safety of personnel and surface vessels and with regard to delaying/cancelling bomb drops if target is not positively identified.

b. Use of all available means to insure safety, including radar tracking of bomber aircraft when possible.

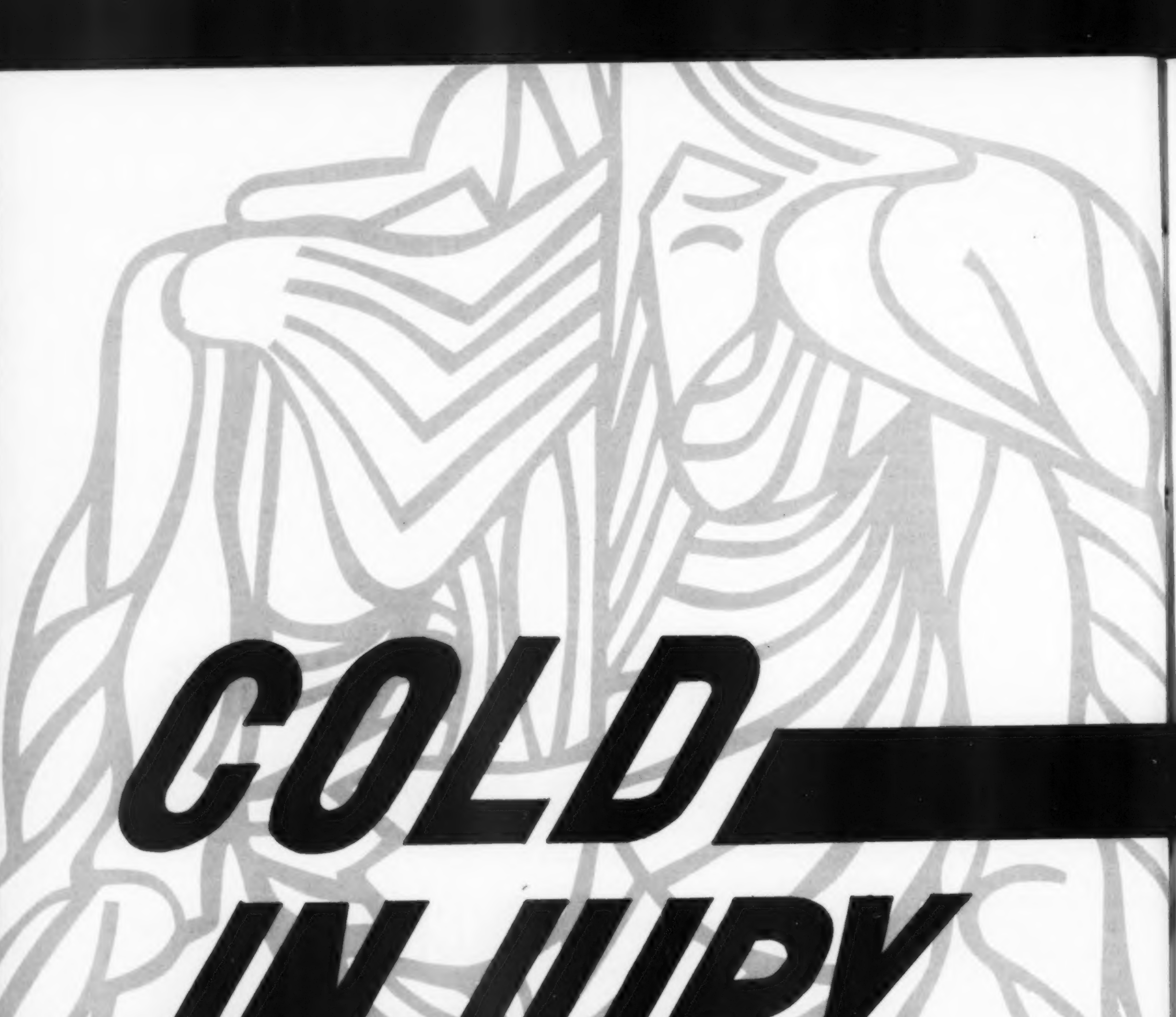
c. Establishment of a positive inbound bombing approach corridor.

d. Bombing aircraft optical verification of its radar target acquisition.

e. Provision for radar tracking of bomber aircraft and for confirmation of aircraft position to the pilot during demonstrations in which surface radars can be made available. This shall include provision for diversion of bomber aircraft flying potentially dangerous tracks and for interruption of bombing runs on the wrong target prior to bomb release.

The primary responsibility for the safety of a bomb drop rests with the pilot. Bombardiers must receive drop authorization from the pilot prior to releasing bombs. The overall responsibility for the control of high altitude bombing exercises rests with the OTC including withholding drop authorization during the exercise, when necessary. He should insure that the exercise briefings by the OCE adequately cover the requirements for safety outlined above.

Bombing training, employing the actual dropping of ordnance from high altitude by radar, is a continuing requirement which is encouraged. ComNavAirPac Instruction 3752.1 presents the basic safety considerations and does not prevent the OCE from imposing more stringent safety measures. ●



COLD INJURY

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Immersion Foot

Immersion foot is a nonfreezing form of local cold injury from intermittent or continuous exposure to water at temperatures ranging from just above freezing in the high latitudes to relatively mild cold at lower latitudes. The severity of the injury is determined by the degree of cold and the duration of the exposure. Mild to moderate degrees of immersion foot can occur under survival conditions in life rafts as a result of prolonged contact of the feet with the cold damp bottom of the raft. Supporting the feet off the deck with life jackets, wiggling the toes and bending the ankles, keeping the feet dry, applying light massage (kneading muscles, not rubbing the skin) and body warmth, and avoiding tight shoes to begin with are measures which will minimize the danger of immersion foot.

Cold water immersion and lowered body temperature is the Navy's biggest potential survival problem in winter operations. Without an antiexposure suit, an airman's chances of survival in cold water are dim.

A Monday morning in midwinter . . . a pilot instructor and copilot student filed for a syllabus cross-country hop in a TV-2 from NAS Jax to former NAS Chincoteague . . . IFR, VFR on top. Although their destination was approximately 575 miles to the north with ocean temperatures in the 40's, the two men wore summer flight suits instead of antiexposure suits. The instructor had on a winter flight jacket—the student a lightweight sweat shirt.

At 1142 the aircraft reported over the Chincoteague radio range at 30,000 feet and was cleared for a standard ADF penetration. Weather and visibility were good. The penetration turn was completed but as the aircraft levelled off at 1500 feet, the engine flamed out. After two unsuccessful attempts to relight, the instructor notified the tower they were ejecting. Between 1200 and 1500 feet altitude at 150 knots the student in the rear seat ejected, followed by the instructor. The temperature of the ocean into which they parachuted 20 miles east of Chincoteague was a cold 46°F. Air temperature was 31°F. The sea state was calm with a 5-knot wind.

(Meanwhile, the SAR operation had gotten underway. The Norfolk DF-radar net was alerted and two helicopters, two P2V aircraft and a Coast Guard UF2G began the search.)

The instructor's parachute descent was uneventful except for a few seconds when his leg was caught in one of his parachute risers. He freed his leg but was unable to get back in the parachute sling. On water entry he had some difficulty releasing his parachute harness because his fingers were cold and stiff. He topped his life vest off orally when it didn't inflate completely and he orally inflated his anti-G suit. After entering the water he removed his helmet.

The instructor swam to the starboard wing tip tank which was floating nearby. Hanging on to the tank, he was able to keep his head, neck and the top of his shoulders a little higher out of the water than he could have with his life vest alone.

Neither the instructor nor the student had a pararaft. According to the AAR, this particular squadron was not using the back pack parachute and seat pack raft because "it placed the pilot too high in the seat to fly the TV-2 comfortably or efficiently."

In spite of his cold, stiff hands the instructor managed to actuate a flare and open a packet of dye marker. When a UF came overhead he fired his second flare with some difficulty. He remembers little about the helicopter hoist except that he was in the sling backwards. He had been in the water for one hour and 6 minutes.

The same helicopter picked up the student some 300 yards away. The helicopter pilot reported that

the survivor was "floating deep with water up to his chin." He was bareheaded and barehanded. He had been able to remove his parachute and had used both flares and one dye marker. Although able to wave at the helicopter and climb into the sling unassisted, he lost consciousness soon afterwards and died on the way to the hospital. He had been in the water one hour and 12 minutes.

Although the survival situation described above took place three years ago, it is representative of a continuing problem. From January 1960, through June 1961, pilots and crewmen without antiexposure suits were in 43 accidents in water colder than 60°F. Many of the survivors when rescued were suffering from mild to moderate exposure and shock. Several men died of drowning as the result of exposure before rescue arrived.

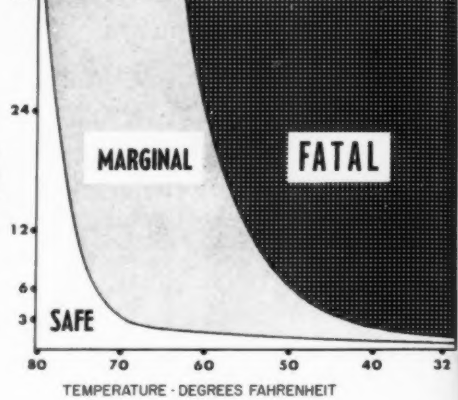
In some of these cases, technically speaking, the pilots and crew did not have to wear antiexposure suits. (OpNavInst 3710.7A states that survival in water colder than 60°F. may be jeopardized without antiexposure suits but leaves requirements up to fleet and type commanders.) The point we are making here is that cold water becomes dangerous in minutes and the fact that you didn't have to wear your antiexposure suit will be of no comfort to you if you have to eject, bail out or ditch into an icy ocean.

Cold water immersion and the resulting lowering of body temperature (the medical term is hypothermia) is the Navy's biggest potential survival problem in winter operations. Without an antiexposure suit chances of surviving for any length of time in cold water are almost zero. Even with rescue imminent, a survivor whose hands are numb and stiff may be unable to release his parachute harness or operate his signal devices to attract attention. With the antiexposure suit the survival picture improves considerably.

Experiments and actual experience have shown that a lightly clothed man in very cold water near the freezing point has a survival time of only a few minutes. Although there is some individual variation, most persons can survive near-freezing water for five minutes but not for longer than 10 to 15 minutes.

With heavier clothing, even though it is wet, the survival times in the same freezing water begin to increase. A man who wears heavy clothing covered by the waterproof, windproof shell of the antiexposure suit may be expected to survive for longer than two hours although discomfort in the extremities and unprotected areas will be severe.

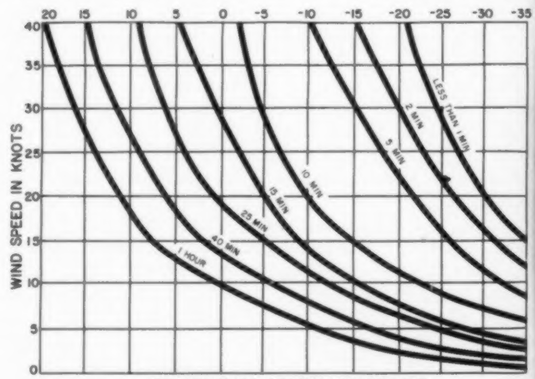
Partly on the basis of laboratory experiments, the estimates given in the following chart based on NavShips table (250-533-7) have been made of the period of survival which can be expected by a man *without* watertight clothing when im-



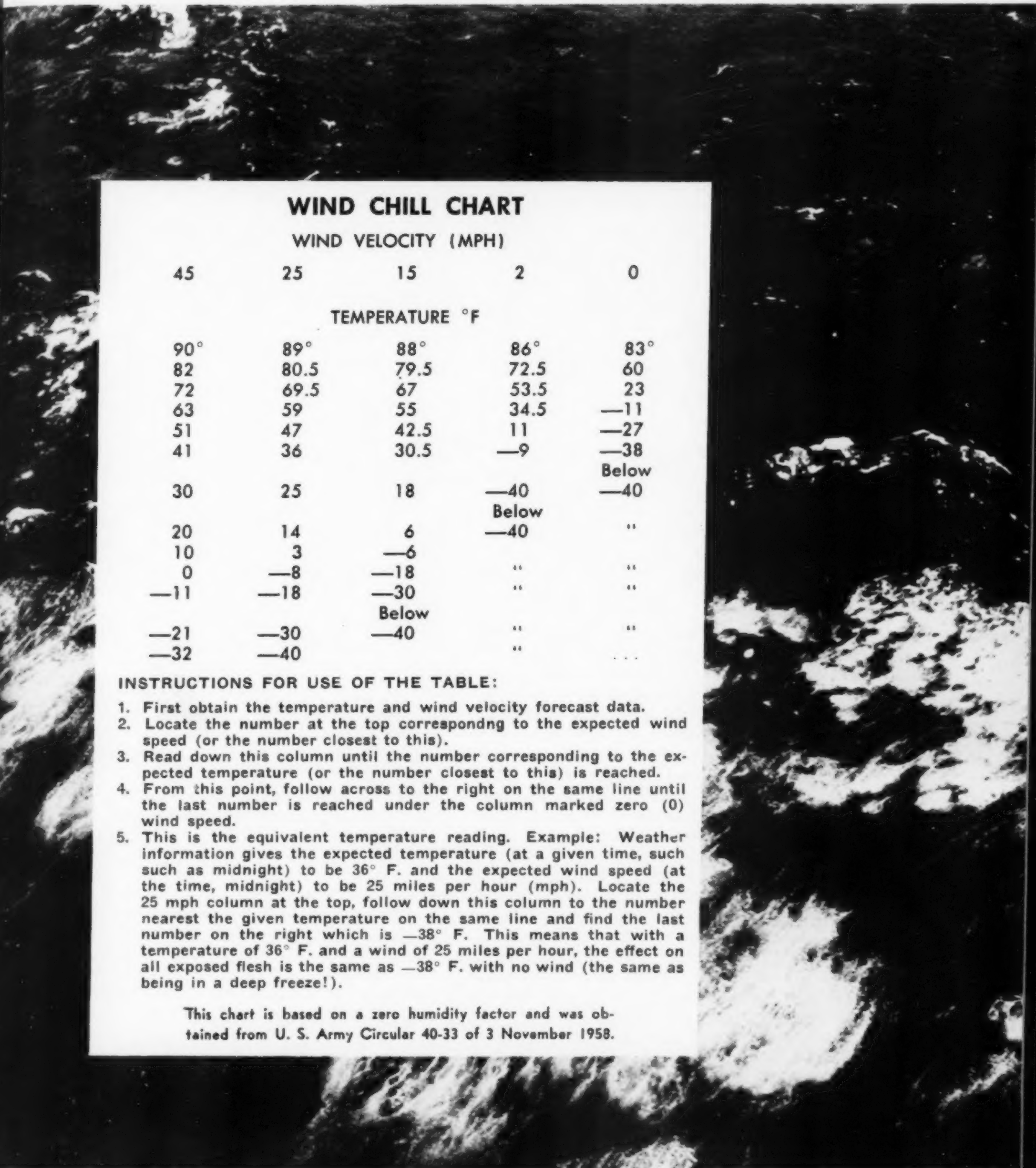
mersed in water at various temperatures. While these figures are approximately correct, individuals vary as shown by the large span of survival duration at higher temperatures. The search for survivors should not be stopped merely because a survival table shows that some of them may have succumbed. (See chart above.)

An additional factor to be taken into consideration is the effect of wind. Everyone knows that it feels colder when the wind blows but most people don't realize how much colder it is. For example, if the temperature is 34°F. and the wind velocity is about 20 miles per hour, the effect on exposed flesh is the same as 38°F. below zero with no wind. (See wind chart opposite page.)

The following, taken from BACSEB 40-54 gives survival time for a man in a Standard Mk-4 anti-



This handy chart, designed for service personnel in polar areas, shows how long unprotected flesh can withstand a given temperature (Fahrenheit) at a given wind velocity. Figures on the curved lines indicate how quickly exposed parts of the body will freeze.



WIND CHILL CHART

WIND VELOCITY (MPH)

45	25	15	2	0
TEMPERATURE °F				
90°	89°	88°	86°	83°
82	80.5	79.5	72.5	60
72	69.5	67	53.5	23
63	59	55	34.5	—11
51	47	42.5	11	—27
41	36	30.5	—9	—38
30	25	18	—40	Below —40
20	14	6	Below —40	"
10	3	—6		
0	—8	—18	"	"
—11	—18	—30	"	"
—21	—30	Below —40	"	"
—32	—40		"	. . .

INSTRUCTIONS FOR USE OF THE TABLE:

1. First obtain the temperature and wind velocity forecast data.
2. Locate the number at the top correspondng to the expected wind speed (or the number closest to this).
3. Read down this column until the number corresponding to the expected temperature (or the number closest to this) is reached.
4. From this point, follow across to the right on the same line until the last number is reached under the column marked zero (0) wind speed.
5. This is the equivalent temperature reading. Example: Weather information gives the expected temperature (at a given time, such such as midnight) to be 36° F. and the expected wind speed (at the time, midnight) to be 25 miles per hour (mph). Locate the 25 mph column at the top, follow down this column to the number nearest the given temperature on the same line and find the last number on the right which is —38° F. This means that with a temperature of 36° F. and a wind of 25 miles per hour, the effect on all exposed flesh is the same as —38° F. with no wind (the same as being in a deep freeze!).

This chart is based on a zero humidity factor and was obtained from U. S. Army Circular 40-33 of 3 November 1958.

exposure suit and liner:

25°F. Air. 50°F. Water	Comfortable after 1 hour
0°F. Air 40°F. Water	Comfortable after 1 hour
0°F. Air 40°F. Water	Comfortably cool after 2¼ hours

Actually the human body is a low-grade furnace stoked with food and fanned by an oxygen draft. As long as you live you produce heat—your problem in keeping warm or cool is a matter of balancing heat produced and heat lost. You lose heat four ways: by conduction, convection, radiation and evaporation, but principally by radiation and evaporation. (You can lose a great deal of body heat by radiation from an uncovered head. This is one more reason for keeping your APH-5 on in the water.)

Nature gave man two important protective mechanisms to safeguard his central or core temperature when exposed to acute cold: 1) peripheral vasoconstriction which shunts blood away from the body surface, thereby reducing heat loss, and (2) shivering, which is an involuntary skeletal motor activity which can increase metabolic heat production up to five times the basal level. At water temperatures lower than 68°F., the rate of heat loss exceeds heat production despite vigorous shivering and core temperature begins to fall. Shivering and also consciousness are progressively depressed as deep body temperature falls below 95°F. From then on hypothermia proceeds unchecked. The body's activity gradually slows and a not unpleasant numbness overcomes consciousness. When the blood temperature approaches 70°F., respiration and heart action cease. Cases are on record of men in such a state of hypothermia being rewarmed and surviving but much is yet unknown about these conditions.

The emergency treatment of immersion hypothermia is immediate and rapid rewarming by immersing the survivor in a tub bath around 110°F. If no tub is available, the survivor should be wrapped in towels or a blanket and put in a steaming shower. After the hot bath or shower, he should be dried gently, then placed in warm blankets. Hot liquids by mouth are helpful but are in no sense a substitute for external heat.

The purpose of rapid rewarming is to restore body heat without the risk of paradoxical cooling, a sharp further drop in deep body temperature occurring after the survivor has been removed from the cold water. Collapse and death are not infrequent when paradoxical cooling takes place. During immersion, the surface tissues, often referred to as the body shell, are relatively bloodless and reach a temperature only a few degrees above that of the water. Return of the victim to a warmer air environment induces relaxation of the skin vessels. As warm blood from the body core perfuses the intensely chilled tissues of the body shell, blood temperatures approach that of the tissues. Upon returning centrally, the now cold venous blood causes the further fall in deep temperature which is termed paradoxical cooling.

The case of an F8U-1 pilot who ejected at sea 5 miles off the coast in January is an example of the beneficial results of rapid rewarming after the onset of immersion hypothermia. Wearing a summer flight suit, torso harness, anti-G suit, Mk3C

Here are some excerpts from accident reports on a number of survivors without antiexposure suits who were fortunate enough to be picked up before they became completely disabled from cold:

- **An HSS-1 pilot, copilot and crew spent 3 to 4 minutes in 58°F. water before being picked up by submarine and helicopter. Air temperature was 61°F. All suffered from mild exposure.**
- **Rescued after 10 minutes in 55°F. water, a T2V pilot and dual pilot were suffering from moderate shock and exposure. Air temperature was 61°F. The pilot's rectal temperature was 95.4°F. The flight surgeon stated in his report that it was doubtful whether the two men could have survived much more exposure.**
- **An AD-6 pilot was rescued after spending 15 minutes in the water and 45 minutes in his raft. Water temperature was from 58 to 60°F. Air temperature was 62°F. He was very cold and shivering violently.**
- **An F3H-2 pilot spent 2 to 3 minutes in 58°F. water, 54°F. air. He was suffering from mild exposure when rescued.**
- **An A4D-2 pilot, after 3 minutes in 56°F. water and 7 minutes in his raft, was chilled and in mild shock when rescued. Air temperature was 61°F.**
- **After 45 minutes in 58°F. water and 30 minutes in his raft (54°F. air temperature), an AD-5Q pilot was rescued by a submarine. "When I was boarding the sub I saw my raft lanyard was still connected to my life vest," he stated. "My fingers were so numb I couldn't get it undone so I cut it with my knife. I dropped the knife."**
- **A pilot and copilot of an F9F-8T ejected. One was picked up after 3 minutes in 58°F. water, the other after 5 minutes. Air temperature was 61°F. Both men were suffering from mild exposure.**

life vest, summer flight gloves, oxfords and an APH-5 helmet, the pilot remained in 38°F. water for 8 to 11 minutes before being rescued. The air temperature was 35°F. The sea was moderate with a 20-knot wind.

Although the pilot inflated his life raft without difficulty he did not enter it. The rescuing UF pilot spotted the survivor clinging to the raft and waving. When brought aboard the plane the survivor was cold and stiff and incoherent. Takeoff was delayed several minutes while the crew stripped him, wrapped him in blankets, set him under a heater outlet and massaged his arms and legs.

"When the patient was seen in the dispensary, he was shivering severely but was alert and otherwise uninjured," the flight surgeon reported. Body temperature approximately 40 minutes after the exposure was 86°F. rectally. After he was immersed in water both at 105° and 110°F. for 10 minutes, his rectal temperature rose gradually over a 40-minute period to 99°F.

From the pilot's statement: "I was dressed in a summer flying suit and skivvies. My left glove had come off and my hand was pretty cold . . . The air temperature was 35°F. and the water temperature was 38°F. The chute did not spill and dragged me about 100 yards before I was able to collapse the chute by pulling the shroudlines. This maneuver put me in a mess of shroudlines and I spent most of the time in the water disentangling myself from the chute. I was in the water only about 10 minutes when I was rescued by a UF. My hands were numb and my legs were becoming so . . . The fact that I was not injured to even the slightest degree speaks very well for the safety equipment in the aircraft. However, an antiexposure suit would have been quite welcome." ●

MONITOR

EXCERPTS FROM SOME OF THE NAVY'S SAFETY COUNCILS THROUGHOUT THE WORLD, WHO PROVIDE LOCAL LEADERSHIP AND EMPHASIS TO THE NAVAL AVIATION SAFETY PROGRAM.

Reminder

The aircraft commander is personally responsible that the occupants of his aircraft are checked out in the use of, and that they have in their possession the proper aviation safety and survival equipment.—*NAS Willow Grove*

Medical Committee

Procedures were recommended for collecting valid blood samples when pilots report suspected carbon-monoxide poisoning. Samples taken in the past have been of no value because of lapse of time from incident to collection of sample, and such other factors as pilots smoking cigarets before blood samples were taken. Recommended pilots notify tower personnel who will notify flight surgeon.—*NATechTraCom*

High Visibility Gloves

High visibility gloves to be used for giving daylight taxi signals on the ramp and adjoining areas to aircraft were approved by the committee. These gloves will be produced by the paraloft for evaluation in limited quantities. If they prove desirable and effective larger numbers will be manufactured.—*NAS Willow Grove Safety Council*

Safety Material Routing

Aviation Safety Material routed for read and initial of active duty pilots has in the past taken as long as three months to complete routing. Pilots and Department Heads are reminded that this material loses its effectiveness if not read while still current. All Safety material must be read within eight hours after reaching each pilot—or else it must be routed on to someone else for reading. All pilots shall adhere to this ruling.—*NARTU Norfolk Accident Prevention Committee*

"What do we

In the summer of 1954, as lightning began to strike fleet aviators with every increasing frequency in the form of orders to a "Safety School" and then to a primary billet as "Aviation Safety Officer" the then embryonic Safety Center began to receive inquiries with equal frequency that distilled down to the simple question, "What do we DO?"

The stock answer was equally simple, "Prevent crashes."

By return mail came inquiry, "How?"

The reply to the latter inquiry was far from simple. Complex studies were published for selected models of aircraft. A crash investigator's handbook was created (including a little gem that solemnly proclaimed a damaged trailing edge on a prop blade proved the prop to have been reversed on impact). APPROACH appeared. CNO's aircraft disaster instruction was rewritten. Again, and again, and still again pitchmen hit the road and exhorted captive audiences. Truly, ". . . the excitement was tense." *

And as the sound of the prang continued to be heard in Naval Aviation, also continued the accompanying plaintive plea, "What do we DO?"

Today, with the truly magnificent achievement during the past 7 plus years in crash prevention ** by Naval Aviation an established fact, it is amusing to reminisce over the anguish this continuing question caused in the souls of the pioneers in the business.

Aviation safety per se, was then, and is today, an intangible concept. Selling a naval aviator a tangible object such as a shiny, fire-engine red convertible is one thing, selling him an intangible concept such as "Fly safe," is another.

Time went by, experience increased, a certain maturity formed in the "safety outfit in Norfolk." Direct and specific answers to the twin questions, "What do we DO?" and "How?" were never printed in a form that succeeded in stopping these questions. Daily the "safety outfit in Norfolk" ingested blizzards of paper; classified, studied and filed them; and based on distillations thereof, published corresponding blizzards of paper to the field.

In retrospect it seems that a pattern developed in our efforts. Roughly this pattern was:

INFORM naval aviation of the fact that our crash rate was too high. "Sensitivity and Awareness" was a much-used phrase in this connection.

DISCOVER through investigation, research and statistics the causes of our high rate of accidents; Past, Present and Future and *disseminate* this information.

TRAIN pilots, crewmen and maintenance personnel in operating practices known to be effective in preventing crashes.

DESIGN aviation equipment with built-in crash prevention items discovered from disaster history, i. e., eliminate "Murphy's Law."

OPERATE within the capabilities of pilots, crewmen and equipment.

EMPLOY the talents of the specialists provided, namely, the Aviation Safety Officer.

EDUCATE all hands in naval aviation, academically and otherwise in all matters bearing on crash prevention.

It is now 1962. Once again the plank-owner from the Safety Center is on the rubber-chicken circuit thumping the tub for crash prevention. Once again, stands up the Safety Officer in the captive audience and once again the welkin rings with the perennial question, "What do we DO?" (Once again causing steam to spout from both ears of the savant at the lecturn.)

Herewith the gist of my answer Circa 1962:

The magnificence of the achievement by naval aviation in attaining the present accident rate cannot be denied. In my opinion, the prime movers

* Apologies to Stanley Holloway.

** See Note 1.

edo now?”

An NASC Plank-owner, Circa 1954, holds forth on Don't bend the bird.

in this achievement have been the commanding officers at the squadron level. It is high time these commanding officers received just credit. In 1953 and 1954 they surely received their share of the blame for high rates.

In answer to the query, "Just how low do you want this rate to go?" My answer is, "to ZERO." Now don't stand up and say, "Easy, put the birds in the barn and lock the door." This won't hack it. Some plumber will drive an NC-5 through the flock and you'll be right back at a high rate of damage. No. We want full-scale operations without accidents.

With today's low rate, it is difficult to conceive the significance of X number of disasters per TEN THOUSAND units of operation. Personally, I have difficulty understanding just how large a number 10,000 really is.

When I look at the sky on a clear, cloudless night I can see only 5000 stars with unaided eyes. This helps a little toward a concept of the size of the number 10,000. Then I consider X occurrences per 10,000 hours again and realize that the crashes that generate today's disaster rate in naval aviation can be considered in the "Isolated Incident" category. (Ah, but the total).

Statistically speaking, a single fatal crash * per 10,000 flight hours belongs in the isolated incident category. (But don't try to tell the victim he's an isolated incident. One life is all we have.) Our present rate of crashes is close to the rate that persons of my age, weight, living habits and temperament keel over in front of audiences due to heart attacks or other odd-ball reasons.

When the crash rate gets down this low, the problem of recognizing, identifying and removing potential causes of crashes becomes difficult but not impossible. (When we were busting them up like peanuts the problem was relatively simple, i.e., check the mags before takeoff; before landing, lower the casters . . . it sliiiiiiiiides so much better.) Crashes are prevented by getting ahead of them and removing possible causes *before* they become actual causes.

Herewith my prescription for preventing crashes in 1962:

►Every squadron has available the services and talents of the specialist in crash prevention; the Aviation Safety Officer.

►Every squadron command should *employ* these services daily.

►When the crash preventer comes up with an idea for preventing a crash, *support* him with all the prerogatives of command. (No matter how far out in left field the idea may sound, hear him out. Preventing an isolated incident occasionally requires some far-out reasoning.)

In the final analysis, crash prevention is an all hands job. The Aviation Safety Officer is there to see to it that all hands are working as a team in preventing crashes. The Safety Officer is effective in direct proportion to the command support he receives. See to it that it does not lack in policy guidance, command attention, and above all, command *support*.

Note 1: Crash prevention is used in lieu of Aviation Safety because safety and accident go hand in glove. In my opinion, most so-called accidents are about as accidental as lighting a fire cracker and holding it until it goes off.

Note 2: Crash is used in lieu of accident because I believe in calling a spade a spade. A crash is a crash is a crash, Gertrude notwithstanding. ●

* See Note 2.

STOOF STUFF

garbage in the wind

The landing checklist for S2F drivers contains two items which other pilots don't have to worry about—"MAD boom IN" and "Radome UP." In 99.999 percent of the cases, both these devices work properly when you flip the switches. However, that .001 percent upsets the routine and results in a landing with the Radome down or the MAD boom extended.

In neither instance is serious damage likely to result but of concern is the fact that in about half the reported cases, pilots and crewmen were unaware of the abnormal landing configuration. For example, prior to making a normal landing, an S2F pilot completed his checkoff list and was twice assured by his radarman that the radome was in the "up" position. Upon landing the pilot felt no swerve nor heard any noise; however, the tower advised that smoke appeared to be coming from the port wheel and further advised the pilot to hold his position. Only after the crash truck arrived was it discovered that the radome had not been retracted and was crushed due to landing impact and scraping on the runway.

Except for the aircraft bureau number involved, this incident was exactly the same as one which occurred a year later in another squadron; "Investigation revealed that the radarman failed to note that the Radome 'up' light came on immediately after pressing the 'up' switch. This indicates a defective switch as it takes from 15 to 30 seconds for the radome to retract."

Both incidents emphasized the fact that radarmen must anticipate a short delay between the time the radome "down" light goes out and the "up" light comes on; delay indicates in-transit time. If no such delay occurs in the light sequence, it is probable that the radome is still down.

Landing with the radome full down causes enough damage to require a new radome at least. Landing with the MAD boom extended apparently leads to no reportable damage since few incidents of this nature are on file. That it does happen, however, is evidenced by a recent pilot report. "During flight," he said, "the MAD boom was extended but the light did not come on to indicate the boom was extended. The bulb in the indicator was replaced but we still received no light signal.

"I flew low over the water and confirmed from the shadow on the water, that the boom was out. After the exercise was completed the MAD boom switch was placed in 'retract' position. I knew the indicator was not working but I assumed the boom positioning mechanism was O.K. and failed to make another 'shadow check' before proceeding home.

"Then after a beautiful approach and a landing, that luckily was in a flat attitude, came the voice from the tower: 'S2F on the runway, your MAD boom is out.' Fortunately there was no damage to the equipment and it was cranked in prior to taxiing back to the line."

There is potential damage in any landing of this kind if the pilot is unaware of his extended boom so the failure of the tower to warn him of such an obvious condition in CAVU weather is poor performance. Conversely, the failure of the pilot to ask for a visual check by tower personnel is in the same category.

Since no one in the aircraft can visually check the position of the radome, the pilot must rely on a proper light sequence, trim change (or lack of) and power requirements. If unusual indications are present the crew must depend on other personnel to confirm the position of the radome. In the case of a doubtful MAD boom, outside assistance is also needed. "Other" personnel can be a wingman, the LSO, aircontrolman in the tower or the wheels watch. The wheel watch can be indoctrinated to treat extended radomes or MAD booms the same as a gear up approach—with flares. ●

ANYMOUSE

CHANNEL 24—where are you?

While deployed flying a VF type we started a night hop at 2045. Our climbout radial was changed from 360 to 270 because of the heavy thunderstorm activity on course 360. The scheduled portion of the flight was normal and we returned to marshal. I was the last of the first four fighters to start down the hill. We were stopped in order at 6000′, 10,000′, 14,000′, and 18,000′ and told to return to marshal which was 240 degrees at 38 miles for me. At this point I had 3800 lbs. of fuel.

Just as I reached marshal the ship broadcast for all fighters to divert to ————————, bearing 070 degrees at 70 miles. The ship then gave individual vectors to each fighter. (One had a weak radio and another joined him making one group of two and two individual planes). When the ship gave my vector they said it was 030 degrees, 70 miles from my present position. I established this course. The ship then advised us to contact Control on 353.8 for further assistance. Control turned out to be located 400 miles away and spoke a foreign tongue.

While calling Control, ——— Control answered but I was unable to obtain any information from them. So many people were calling on 353.8 that I imagine that most of my transmissions were cut out. I took a last check on my Tacan at 030 degrees, 55 miles and then switched to ———————— Tacan, Channel 92. I never did get a reading from 92. I flew for three more minutes and then started a port orbit at 22,000′.

I was supposed to be over the city. All I could see was a small city below that obviously was not it. There was an overcast that could have been hiding the city but I couldn't see any grow of lights so I didn't think that this was possible.

I continued to broadcast for information on 353.8 and finally was told to switch to 257.8 by ———— control but was unable to contact the tower on that frequency. I decided I would

The purpose of Anymouse (anonymous) Reports is to help prevent or overcome dangerous situations. They are submitted by Naval and Marine Corps aviation personnel who have had hazardous or unsafe aviation experiences. As the name indicates these reports need not be signed. Forms for writing Anymouse Reports and mailing envelopes are available in readyrooms and line shacks. All reports are considered for appropriate action.

— REPORT AN INCIDENT, PREVENT AN ACCIDENT —

have to descend below the overcast if I was ever to find a field so I started a slowly descending spiral and continued to broadcast for information and assistance on 257.8 and 353.8. At 14,000′ I leveled off and tried to think of another alternative to descending further. My low fuel warning light came ON and I immediately elected to switch to Guard and squawk "Mayday." A controller from the ship picked up my Mayday squawk and gave me a vector to the city—130 degrees, 60 miles. By now there was 1400 lbs. of fuel indicated but I was forced to keep descending to stay below the overcast. This steer from the ship was the only information I had received.

I did not see the lights of —— until I was 10 miles away due to being at such a low altitude. I kept my airspeed at 380 knots so that I would be able to fly away from —— if I flamed out from fuel starvation. Finally I managed to pick out the runway lights from the rest of the city and commenced slowing for a straight in approach. At 250 knots I dropped the gear and at 200 knots put out the slats and then held 180 knots in the groove. This aircraft had the Martin-Baker seat with an integrated harness. If the engine flamed out I wanted enough airspeed to stop the sink rate and aim the aircraft for a clear area in the vicinity of the field.

Just prior to touchdown I dropped the flaps and commenced a flare. I crossed the green lights with 75 lbs. on the fuel gage and touched down at 135 knots. The runway was wet but it was not raining and I stopped and turned off after 6000 feet of roll-out. I parked on a cross taxiway just off the runway and shut down at 2250.

Upon entering the flight service office I learned that no one there knew we were diverting. Also that channel 92 had recently been changed to channel 24.

The aircraft holds 1508 gallons of fuel, 15 of which is unusable. When the aircraft was gravity fueled at —— it took 1503 gallons. Allowing for an error of 30 gallons on the fuel truck gage gave me about 20 seconds to go before fuel starvation.

What a hooligan show! Is this really all *of the story? Incidentally, wasn't your ARA 25 working?*

Very resp'y,
HEADMOUSE

Squeeze Play

THE A4D squadron scheduled a road recco and shortly after 0900 three aircraft were airborne and headed for the mountains of western Virginia. To closely simulate combat conditions, the selected road area was situated in a valley bordered on both sides by mountains. Although the flight was careful to maintain 1000 feet over the valley itself, the pilots were flying below the ridge tops a half mile on either side. The road followed a crooked path through the mountains and the flight was forced into many turns.

Number 2 pilot, while keeping the leader in sight, was maintaining a position aft and stepped up. He entered a descending right turn of about 60 degrees bank to follow a turn in the road and when the road straightened out and the leader rolled his wings level, number 2 attempted to duplicate the maneuver. He only attempted it because when force was applied to the stick there was no response. The ailerons were frozen!

At this point the aircraft was descending rapidly in a pronounced right-wing-down attitude. The mountain ridges which seconds before had been a safe half mile away were now too close for comfort. Back pressure on the stick would have only aggravated the attitude; to disconnect the hydraulically controlled ailerons in the present attitude could have the same effect.

Available airspace was shrinking fast and the pilot determined to try aileron trim. It was a slow method. The right wing started coming up but the jet was still below the mountain ridge ahead. Waiting until the last possible second to eject, the pilot finally felt the wings were level enough to apply back stick. An instant before his contemplated ejection point he saw he would clear the ridge and then in a tree-shaking blast of jet wash he was over the top with clear sky ahead.

After a spiraling climb to 10-thousand feet the boost was disconnected since full left aileron trim would not maintain a wings-level attitude. After a safe landing at home base the aircraft was grounded for investigation of its near-fatal actions.

The cause of the jammed stick was a binding in the control stick upper arm forward pivot bearing due to improper assembly of the bearing into the yoke. This particular part had been installed by an O&R five weeks before and though a critical failure it was felt to be an isolated one.

Although as much aileron trim as felt possible was removed before disconnecting, some remained. Anymouse noted that had his trouble been in the hy-

draulic system the trim remaining could have put the aircraft into an overstress or near uncontrollable condition. After gaining a safe altitude he recommends returning trim to neutral (accepting the resulting bank angle) prior to pulling the disconnect. Assuming plenty of altitude, another effort would be to attempt to move stick in both directions to free a control stick binding from these causes.

Make Way

A flight of five ADs were returning to their West Coast home after completing a practice bomb hop and as per course rules, the flight leader called home plate for landing info. Given the wind and duty runway, the flight was instructed to call initial point. At initial point the flight leader called and we were cleared into the break at 2000 feet altitude.

Meanwhile an A3D had declined a clearance to land on our short runway (7000 plus feet) and requested the long runway (10,000 plus feet). The tower cleared him to waveoff and climb to 2000 feet, advising that five ADs were entering the pattern for the break. The pilot rogered and commenced to climb to 2000 feet.

So here we were, coming up on the break with an A3D climbing up below us. I was number 5 man and when we were in break position I saw the A3D's nose coming up under mine. Forthwith I executed an emergency breakaway to the right and warned the rest of the flight that the A3D was coming up under us. Number 4 looked out and saw the A3D flying number 5 slot with his wing overlapping number 4's.

Number 4 executed an emergency break to the left when space permitted and avoided another midair collision. I called the A3D pilot and told him about it and he replied "The tower cleared me to 2000 feet." Although he was cleared, he was also advised of traffic which he apparently did not look for.

WHIZ QUIZ

1. A procedure turn is not required for a VOR approach, providing authorization is on the chart using what methods?

2. Regulations for rate of climb applies to enroute and holding aircraft. Describe the procedure to be used when cleared to climb or descend.

3. The visibility will never be less than what distance when any airport is being used as an alternate?

4. Airport Traffic Control handles VFR air traffic movements in the immediate vicinity of an airport. True or false?

5. The alternate airport weather minimums for IFR flight refer to the weather forecast for the time of arrival. True or false?

6. You are utilizing an HF/DF steer from an Air Force Base, the operator advises you that your steer is a class "B" steer. This means—
   a. You must hold a green card to utilize this steer for an actual IFR approach.
   b. Accuracy will be within 5 degrees.
   c. Only multi-engine aircraft may utilize this steer for an IFR approach.
   d. Error will be greater than 5 degrees.

7. VOR/VORTAC/TACAN NavAids are being "classed" (L), (M), (H), to designate the intended service area of the facility. What are the designated altitude service and interference free distance services for each class?

8. When the approach lights are inoperative, what are the straight-in landing minimums for ILS or PAR approaches?

9. Are all components of the ILS and the compass locators as well as all of the lights required to approach to Runway Visual Range minimums?

10. While homing on an Air Force range station that broadcasts weather, you can expect to receive a scheduled weather broadcast at:
   a. 15 minutes past each hour
   b. 40 minutes past each hour
   c. 35 minutes past each hour
   d. 29 minutes past each hour.

For answers see page 20

Two's A Crowd

ON an early morning launch, with calm winds and clear skys, our TF-1 was instructed to taxi into position and hold on runway 18 while another TF was landing on runway 29. Shortly after the landing TF rolled by the intersection of 18-29, we were cleared to go.

As we commenced rolling I noticed the other TF had made a 180 turn and was taxiing back toward the intersection. But since I had been cleared for takeoff I assumed the tower would instruct him to hold his position short of my runway. However, this was not the case.

The other TF continued moving directly onto the runway ahead of me and I had to make a radical pull-up to avoid a ground collision.

Under the circumstances the use of two runways expedited operations but the other TF was a transient and not fully aware of local habits, in addition to which, there was obviously a lapse of coordination in the tower.

Have a problem, or a question?

Send it to

headmouse

he'll do his best to help.

U.S. Naval Aviation Safety Center, Norfolk 11, Virginia.

On Budgeting the Amps

Dear Headmouse,

In recent months we have been deluged with printed matter concerning electrical problems confronting P2V pilots following an engine failure. Naturally this is of great concern to us P2V drivers. We religiously brief all pilots frequently on the proper emergency procedures to be followed in the event of total or partial loss of DC power.

The solution to this problem appears to be so utterly simple that it must have occurred to every person connected with the P2V—manufacturer, BuWeps, the Safety Center, pilots and crewmembers. Therefore, there must be a simple reason for not adopting this obvious solution.

Will someone please answer this question: Why is a DC generator not attached to the jet engines on the P2V?

The only answer I have ever received to this question is that it is too costly. This cannot be a satisfactory answer, since lives have been lost (and may be lost in the future) and aircraft damaged (and may be damaged in the future). And the new ASC incorporating constant speed (Sundstrand-type) AC generators will undoubtedly cost far more than the simple remedy of hooking up a couple additional DC generators to the jets on the old bird. The mounting pads for generators are already on the engines!

Not one pilot, tech rep, maintenance officer or electrician here at Brunswick has been able to give me one satisfactory answer as to why we don't have generators on these jets. Does the Safety Center have one?

P2VMOUSE

►Your question is valid but the answer is not simple. You stated that, "We religiously brief all pilots frequently on the proper emergency procedures to be followed in the event of total or partial loss of DC power." This statement contains the key to our problem—proper emergency procedures. Our first problem is to prevent the loss of DC power. Installing DC generators on the jets will not solve this problem entirely, *because jets are secured during the major portion of any flight.* If a reciprocating engine malfunctions while the jets are in operation there is generally no problem and there certainly would not be a problem if the jets were operating extra DC generators. Since the jets are not operated continuously the generators would be useless until the jet is started.

The problem involves time. The DC overload occurs at the initial moment of feathering. If there is *time* to secure part of the DC load and then start the jets before feathering the pilot will generally have no electrical problem.

But such is not always the case. The P2V driver is usually caught with a majority of the following conditions: jets secured, acute need to feather, and a critical DC electrical load. (Night, instruments, icing, . . . may be additional factors.) When Headmouse studies all these factors, the simplest and quickest change seems to be a method of securing all three inverters, switching to emergency inverter and switching the MF-1 compass to G-2 in one operation through the use of a Gang-bar or switch located within easy reach of your good right hand. At the same time the copilot could be putting the jets into the windmill position. After feathering, check the need for electrical equipment and secure those items which will not be needed before going back to the No. 1 inverter.

Answers to Whiz Quiz

1. A procedure turn is not required where the word "final" applies for a transition to the omni and where specifically approved under radar transitions to the omni course.
2. Climb or descend as rapidly as practicable to within 100 feet of the assigned altitude and then not to exceed 500 feet per minute to the assigned altitude.
3. Jet—2 miles; Piston—1 mile. However, flights operating under part 41 have the flexibility of the time-of-arrival forecast.
4. True.
5. False.
6. (b)
7. (H) Alt. Service 75,000 msl
(M) 30,000 msl
(L) 15,000 msl
(H) Interference 180 mi.
(M) Free Distance 90 mi.
Service 45 mi.
8. Jet minimums not less than 400-1, 1000-½, local surface conditions. Piston minimums not less than 300-¾, or 400-½.
9. Yes, at all RVR stations except Newark. All components of the ILS are not required at Newark but the compass locators and lights must be operating.
10. (d) 29 minutes past each hour.

It is my understanding that BuWeps is considering a master switch mounted in the cockpit which would cut off all unnecessary DC circuits when actuated. The latest status of this proposal is unknown. If considering cost, this item will not be cheap and neither would installation of generators on the jets when you add wiring and associated parts. What we want is the best system for our money this time.

So, if you have an occurrence in your squadron or you hear of one please help the Center obtain the details whether they are positive or negative. List the electrical equipment in use at time of occurrence. Tell us what steps were taken prior to feathering as well as what was done after feathering. If any electrical discrepancies were subsequently determined as causes please report them too.

Very resp'y,

Headmouse

Distribution of NASC Publications

When requesting an address change or changes in quantities of APPROACH Crossfeed or Weekly Summary, please include your old address label. This will expedite the handling of your request as well as preventing misaddressing of your mail because distribution labels are prepared considerably in advance.

Underboosting

Dear Headmouse:

SOP requires the RPM to be increased to 2600 when the gear is lowered commencing GCA final or at the 10-second gear warning. Pilots indicate that they are not able to maintain 1" of manifold pressure per 100 rpm on the final with a light airplane. If 26" MP is used, the speed sometimes increases beyond acceptable minimum. If the power is reduced by 3" or 4" to maintain proper speed and keep the aircraft on glide path, is there danger of underboosting?

ANYMOUSE

► In this particular case the desirability of having the RPM available for a waveoff and to keep from overboosting is more important than the requirement of 1" per 100 rpm. In order to accomplish desired training we knowingly accept underboosting in other procedures. However; where prolonged underboost situations can be eliminated without sacrificing flight safety, the detrimental effects will be substantially reduced. Underboost damage results when insufficient pressure in combustion chambers causes tensile forces to be applied to connecting rods, thereby causing piston rings to be dragged by pistons, the lower or weak side of piston pin bosses to crack, cap ends of connecting rods to crack or pull off and rods themselves to fail in tension. Now if you wanted this condition, you could obtain it by dropping the nose, hauling the throttles off and letting the slipstream drive the propellers and drag the engine.

In the strict sense of the word, the underboost situation exists during any intake cycle of a four-cycle internal combustion engine when manifold pressure is near or somewhat less than crankcase pressure. Obviously, if engine parts were not built to resist this situation, they wouldn't last very long. Since you control your rate of descent with power, and airspeed with the elevator, in most cases you will *squeeze* a little power off or add a little during the final approach to keep within limits. If the power is reduced and applied in this manner, there is little need to have concern for underboosting, but if a long fast descent is made then the aircraft must be properly configured and the RPM and manifold pressure must be kept in proper proportion.

Very resp'y,

Headmouse

"We won a global war to insure the safety and dignity of human life. We who have survived would be wasting the sacrifices of brave youth, if we now permit carelessness and thoughtlessness to increase accidents." *—Dr. Ralph W. Sockman, Minister, Christ Church, New York City*

"I believe an organized well-integrated accident prevention program is essential in every community. It is your job, my job, everybody's job to stop accidents."*—Paul G. Hoffman, National Safety Council*

"In the field of human relations, nothing is so important as safety. Safety applies with equal force to the individual, to the family, to the employer, to the state, to the nation, and to international affairs. Safety in its widest sense concerns the happiness, contentment, and freedom of mankind."*—William M. Jeffers, former president of the Union Pacific Railroad Company*

"The biggest challenge to all safety workers is the creation of a universal state of mind that will automatically rule out the needless and heedless accident."*—Percy Bugbee, General Manager, National Fire Protection Association*

Impromptu D.R.

From Cruise Flight Level to Touch-Down

By Captain Thad May, TWA

"If the air traffic controller was not providing radar vectoring, then who was responsible for the plane's navigation?"

Replied Hendershot, "The pilot!" These were the last words from the government, spoken by FAA official Wayne Hendershot at the close of the UAL/TWA accident hearing in Brooklyn, New York recently.

And how right he is!

The official investigation resulting in issuance of the "Probable Cause" is for the officials. Nevertheless, small groups of pilots in hotel lobbies around the country are busy doing a little constructive analysis of their own. We don't mean to second guess the deceased pilots, but we see a new threat to our security, so we instinctively try to imagine all possible factors which might contribute, and then devise our own safeguards.

One obvious fact emerging from this accident is that one of the victims was not where he thought he was! We are the first to defend the pilot against those who imply "pilot error." Not because he's from our group, but because we have traveled this road too, and we know how easily one can be led astray by a combination of erroneous indications from our radio navigation equipment. Cross-checking is our trade mark, but there are rare occurrences in which two erroneous signals can add up to a "copecetic" situation. . . .

. . . Progress is an inevitable product of our society, and I'm sure we pilots would not trade the Flight Path Deviation Indicator for a static-y "did'da." However, we can never gain something without giving up something, and so it is with our modern VHF radio navigation equipment. The integrity of the low frequency range and an air driven gyro, crude as they were, did not hinge on circuit breakers, transformers, and "dimestore" fuses.

The weird behavior of the sometimes fickle Radio Magnetic Indicators and Flight Path Deviation Indicators is too well known to us all to warrant further mention here. . . .

. . . It's ironic in this modern age of atom bombs and digital computers that our most useful tool may be found by reaching back 200 years for a science used by Captain Cook—Dead Reckoning. It's also ironic that this science requires only our simplest and most reliable instruments—compass, airspeed indicator and clock.

Does this mean we must clutter the cockpit with mercator charts, dividers and plotters? No. But there is a way by employing a sort of Impromptu D. R. (permit me to coin a phrase.)

When used over long distances with infrequent fixes, one must be meticulous for success with D. R. However, over short distances, a "Bobtailed" approach is amazingly accurate.

Simply stated, "Impromptu D. R." is the art of following the progress of your plane by latching onto a heading, monitoring the clock as you proceed from fix to fix, and protecting yourself with a shrewd "guesstimate" for your next fix. This technique is intended to replace the tendency to "chase the needle" and assume you are there when it swings.

If you are familiar with the local area (distances) and have a general knowledge of current winds, this can be done without bothering with charts and computers. If not, it is certainly good insurance to delegate this responsibility to your first or second officer.

A preflight study of weather and winds will have prepared you to make an intelligent guess at ground speed even though you may be descending and varying your true airspeed. Using this ground speed and working in increments and multiples of increments shown below, ETA s sufficiently accurate to *double check* your radio navigation instruments can be obtained. By adding your personal touch of intuitive interpolation and establishing the habit of practicing when VFR, you can convert this science of navigation into a highly precise *art*. And then, if those radio signals don't jibe with your D. R.—suspect the radio!

I recall an instance a number of years ago, of being cleared from New Brunswick to Flatbush with a restriction to cross Flatbush at 3000 feet, then descend to 1500. It was wintertime, and we were on the gages. A neat reversal of the ADF

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needle signaled Flatbush! We were "tooling" along at a fast clip because of a high descent rate, but a quick check with the clock indicated a ground speed of around 500 mph and therefore alerted us to the erroneous needle swing. It later developed that high speed and ice had stripped us of a sense antenna.

Since this incident, I have found comforting security in keeping track of my position by this art of Impromptu D. R. In spite of all this electronic gear, it's still the best tool we have to safeguard us from erroneous radio signals and human error from the ground controller. In fact, Dead Reckoning is the only pure method of navigation. All other "methods," such as radio, pilotage, pressure pattern, celestial, inertial, etc., are merely aids to D. R.

ETA by D. R.

	Ground Speed (MPH)		Distance (Miles)	Times (Minutes)
	180		6	2
	210		7	2
	240		8	2
or:	180		9	3
	200		10	3
	220		11	3
	240		12	3
	300		15	3
Jet	500		25	3
or:	500	approx	8	1
	600		10	1

—*Flight Safety Foundation, Inc.*

Mental Dead Reckoning

Pilots Safety Exchange Bulletin 61-103 (May) featured an article authored by Captain Thad May on the subject of aircraft navigation and the value of dead-reckoning in this modern age. The article enjoyed considerable favorable response, and among the letters was one from a former navigator on all-weather fighters for the RAF. Following is a portion of this letter, plus four interesting rules-of-thumb.

"I was delighted to see someone advocating the use of 'mental D.R.' because, in my opinion, it has been very much neglected lately. I flew as a navigator in the RAF where mental D.R. was at time essential to our operations. Here are some rules-of-thumb which may be of interest:

1. Flying at 20,000 feet the reading on the Mach meter can be directly interpreted as your true airspeed in (nautical) miles per minute flown.

e.g. 0.6 Mach at 20,000 feet is 6 nm per minute $= 360$ k.

2. At 40,000 feet the IAS is almost exactly one-half true airspeed.

e.g. 250 k IAS at 40,000 feet is 500 k TAS.

3. To compute time for distance to go, there is a simple technique which avoids the use of tables. The idea is to convert your known (or estimated) ground speed into miles per minute flown.

e.g. Distance to next fix: 72 nautical miles
Ground speed: 360 k
Miles per min: $\frac{360}{60} = 6$ mpm
Time for 72 nm: $\frac{72}{6} = 12$ min.

If you are flying at some speed which is not an increment of 60 k, there is a method of getting around this to avoid mental computations of fractions of miles per minute.

e.g. Ground speed: 270 k This lies halfway between 4 and 5 mpm (240 & 300k)
Distance to go 20 nm
Time at 4 mpm $=$ 5 minutes
Time at 5 mpm $=$ 4 minutes
Since 270k lies between the two speeds, the time for 20 nm is $4\frac{1}{2}$ min.

This may appear a bit complex at first sight, but after a little practice I have found it effective.

4. Also useful is the '1 in 60' rule. An angle of 1 degree subtends a distance f of one mile over a distance of 60 miles. From this it follows that over 30 miles the distance off for 1 degree is $\frac{1}{2}$ mile, etc.

e.g. You are flying an airway for which the VOR radial is 270 degrees. Your VOR is in fact indicating 260 degrees (TO), and by D.R. (or DME) you have 30 miles to go. You want to know your position relative to the airway centerline:

30 miles $= \frac{1}{2}$ mile for 1 degree
VOR error $= 270° - 260° = 10°$
Track error $= 10 \times \frac{1}{2} = 5$ miles N.

In this example the rule is, of course, subject to VOR errors, but apart from this it is accurate up to angles of 15 degrees over 60-mile distances."

Any comments, pilots?

—FSF, Inc.

On deck contact a loud explosion . . .

. . . told me something was wrong . . .

Success Story

. . . I promptly grabbed the curtain . . .

"WHEN I contacted the deck there was a loud explosion and the aircraft yawed to the right. I knew that something was wrong because I was closer to the deck than normal. I felt a deceleration and then a release. I had applied full power but felt no response. I knew that I was going to go off the angle and elected to eject using the face curtain (Martin-Baker seat).

"I hit the water with my back to the wind. Upon contact with the water I released my right shoulder rocket-jet fitting easily, but the left fitting stuck. I sank underwater, but had no trouble breathing because of the bailout oxygen bottle connected to my mask. I then inflated my Mk-3C life vest and after coming to the surface released the left rocket-jet fitting by using both hands. . . The helicopter pick-up was excellent."

Carrier landing and takeoff emergencies

Ditch or Eject?

... as I went off the angle without power ...

... the seat fired ...

. . . the chute blossomed just before I hit the water.

WHETHER to ditch or eject in an emergency at low altitude on or around the carrier was largely an academic question until the new low altitude capability seats, including attachments and modifications to the basic Navy seat, came into general fleet use. It is still not possible to state an absolute policy on the subject, for as with many other airborne emergencies, only the pilot can weigh all the factors. *But certainly, all pilots and their commanders, can discuss and pre-plan some likely courses of action.*

A sizeable majority of jet aircraft ditchings, with the possible exception of the F3H, result in fatalities. By their very design, most jet aircraft cannot be expected to ditch well. Impact speeds are high and the resulting forces on the pilot are at best extreme. By contrast, low altitude ejections utilizing the Martin-Baker and Rocket seats are favorable as shown by recent experience. Statistics are insignificant because of the small sample. A goodly number of deck level ejections however, have been survivable. Here again, the figures are misleading because pilots have been lost during the rescue effort. For the moment the pitch seems to be: (a) an ejection within the envelope of the escape system involved is preferable to staying with the aircraft; (b) at low altitude the pilot must decide promptly whether the emergency is an ejection situation or not. (Let's face it, of course sometimes he can't tell; (c) the use of afterburner (or zoom if control and speed available) to gain even 50 feet of altitude prior to ejection gives the pilot a better chance to enter the water prepared for the survival effort that follows immediately.

The emergency which requires perhaps the fastest pilot response of all is the situation where the aircraft is about to leave the flight deck without sufficient speed to maintain flight. On a carrier launch or recovery, there will be at least 30 knots of wind across the deck and this, combined with the forward speed of the aircraft, will greatly increase the somewhat marginal chances for successful chute deployment. Whatever the case, the pilot generally faces almost certain death if he goes into the water with the aircraft. With the advent of the low altitude seat — even though deck level, low speed situations are normally out of the seat design envelope, the pilot still has some chance of survival if he ejects before the aircraft starts its downward plunge.

The low altitude capability of particular ejection seats is described in sources listed below. The Standard Ejection Criteria in Flight Manuals will greatly aid in establishing a Go — No Go point. It is understood this information will be available in early 1962.

F8U	BuWeps Message 112028Z Jul 60	Reprinted 7-60 Systems Crossfeed
F3H	BuWeps Message 112028Z Jul 60	Reprinted 7-60 Systems Crossfeed
*F4D	BuWeps Message 101105Z Apr 61	Reprinted 4-61 Systems Crossfeed
**FJ4B	BuWeps Message 101105Z Apr 61	Reprinted 4-61 Systems Crossfeed
A4D ·	Escape Crossfeed 9-60, A4D Crossfeed 11-61	

* NavWeps 01-40FBA-1, Interim Rev. 33. ** NavWeps 01-60JKD-501, Interim Rev. 20.

SURVIVAL

Sounds a bit gruesome, doesn't it, this survival of the fittest business. But it's a grim reality for military aviation personnel both in peacetime and wartime.

Because of its very nature, flying must always be fatiguing to some degree. Noise and vibration, physical discomfort, immobility and monotony are some of the determinants of flight fatigue.

We have made great strides in developing aircraft with increasingly longer ranger, higher performance and greater technical complexity. It is, therefore, imperative that we maintain our human machine in the best possible physical condition to cope with these complexities.

Figure for yourself the exposure odds to emergencies demanding your physical stamina.

In the last two years alone, almost 200 surprised shipmates have successfully ejected from disabled aircraft, many into the sea. Almost the same number of pilots, aircrewmen or just plain old ground presiding passengers have been involved in ditchings or crash landings. Around 50 found themselves obliged to bail out the old fashioned do-it-yourself way. And on the ground side, while there are no complete figures of bluejackets falling overboard from carriers, or exposed to various demanding emergencies ashore it is obviously considerable.

Each of these emergencies—and fortunately very few of them are fatal—makes great physical and mental demands on the individual. To some extent each major mishap is a do or die survival situation.

While there are no figures obtainable on how many men might have survived parachute entanglement, an extended period in difficult seas, or in rugged terrain had they been more physically fit, *there are* several good examples of men who were in above average physical shape who did survive rugged ordeals. Some of these have been recounted previously in APPROACH.

Add to these possible emergencies the need for good health to be happy and effective in our careers and personal lives, and to withstand the rigors of equally threatening non-duty accidents. Thus the case for plain, common, ordinary physical fitness for all naval aviation personnel becomes downright imperative.

Even before BuPers Instruction 6100.2 was is-

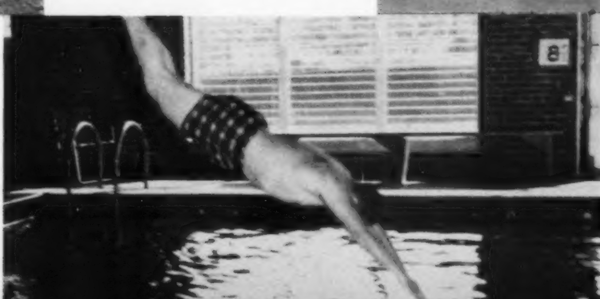
"The complexities of the world in which we live, the seriousness of the peril facing our nation, the need to keep our Navy strong and ready requires a lot of hard work from every one of us today, tomorrow and for a long time to come. So set a pace that can be maintained and have your commands and staffs organized, trained, indoctrinated and administered accordingly. *Keep yourself PHYSICALLY FIT AND MENTALLY ALERT.*"

George Anderson

Admiral George W. Anderson, Jr.
Chief of Naval Operations

OF THE FITTEST

Have you got what it may take?



Every emergency makes great physical and mental demands of the individual.

sued last summer, we had already planned to write an article for this issue of APPROACH on the subject —Physical Fitness.

We were going to tell you that in summer you have all kinds of sports from the floating volleyball game at the beach club to following the power mower around the petunia beds. We were going to say that now it's winter and you get less exercise . . . less sleep with the kids' homework, late TV viewing and socializing . . . and you do more partying with all those extra calories. So you probably face the new year and the coming spring in pretty poor shape . . . weight gained and muscle tone lost. We were going to tell you all this and then advise you to do something about it in your own interest. We are still of the opinion that it is very much in your own interest to improve your physical fitness—and now BuPers Instruction 6100.2 makes the program official.

A strong voluntary sports program with its leadership and morale building values is the best way to maintain physical fitness. The Navy has always advocated intramural and varsity athletics and encouraged commanding officers to set up local physical fitness and sports programs. In some areas, group calisthenics and weight training programs have met a need. Gyms, swimming pools, tennis courts and playing fields are available at naval stations and many ships have exercise rooms. Some personnel take advantage of these facilities; others don't.

BuPers Instruction 6100.2 is designed to help commanding officers institute compulsory physical conditioning programs where facilities are not available for voluntary programs or where voluntary participation has been inadequate. This instruction sets up physical achievement standards for men under 40 (see box). Those who cannot pass these tests go into a physical conditioning program.

Other plans in the offing are for physical fitness programs for men 40 and over and for women as well as an information program for dependents. These programs will help make sure that Navy personnel are physically fit, both for their own good health and well-being and for maximum preparedness and efficiency in operational and survival conditions.

Once you become accustomed to regular exercise, you soon realize how much better you feel because of it. Exercise does all kinds of things for you:

- It increases your sense of well-being and alertness.
- Improves your posture and appearance.
- Helps circulation.
- Promotes elimination of waste products.
- Increases your resistance to fatigue.
- And—most important to pilots and crewmen —it builds up endurance and strength to draw upon in emergencies.

Exercise is perhaps the most important part of physical fitness but there are a number of additional factors—adequate sleep; proper diet and weight control (see APPROACH, October 1961, p. 26); moderation in drinking, smoking and partying; avoidance of self-medication; and finally, prompt attention to minor illnesses. And, remember, if you encounter any medical problems in your physical conditioning program or in your health in general, see your flight surgeon right away. ●

As minimum requirements are not proposed for male personnel 40 and above, commanding officers should prescribe conditioning programs that bring about efficient performance of assigned duties, but which are not so severe as to be detrimental to the health of the individual. Normally, regular participation in any competitive physical activity will accomplish this purpose.

The exercise chart below should be used for preconditioning prior to taking the quarterly Minimum Physical Achievement Test. For those failing to perform the required minimums satisfactorily, the exercise chart is also a physical conditioning guide.

Minimum Physical Achievement Test

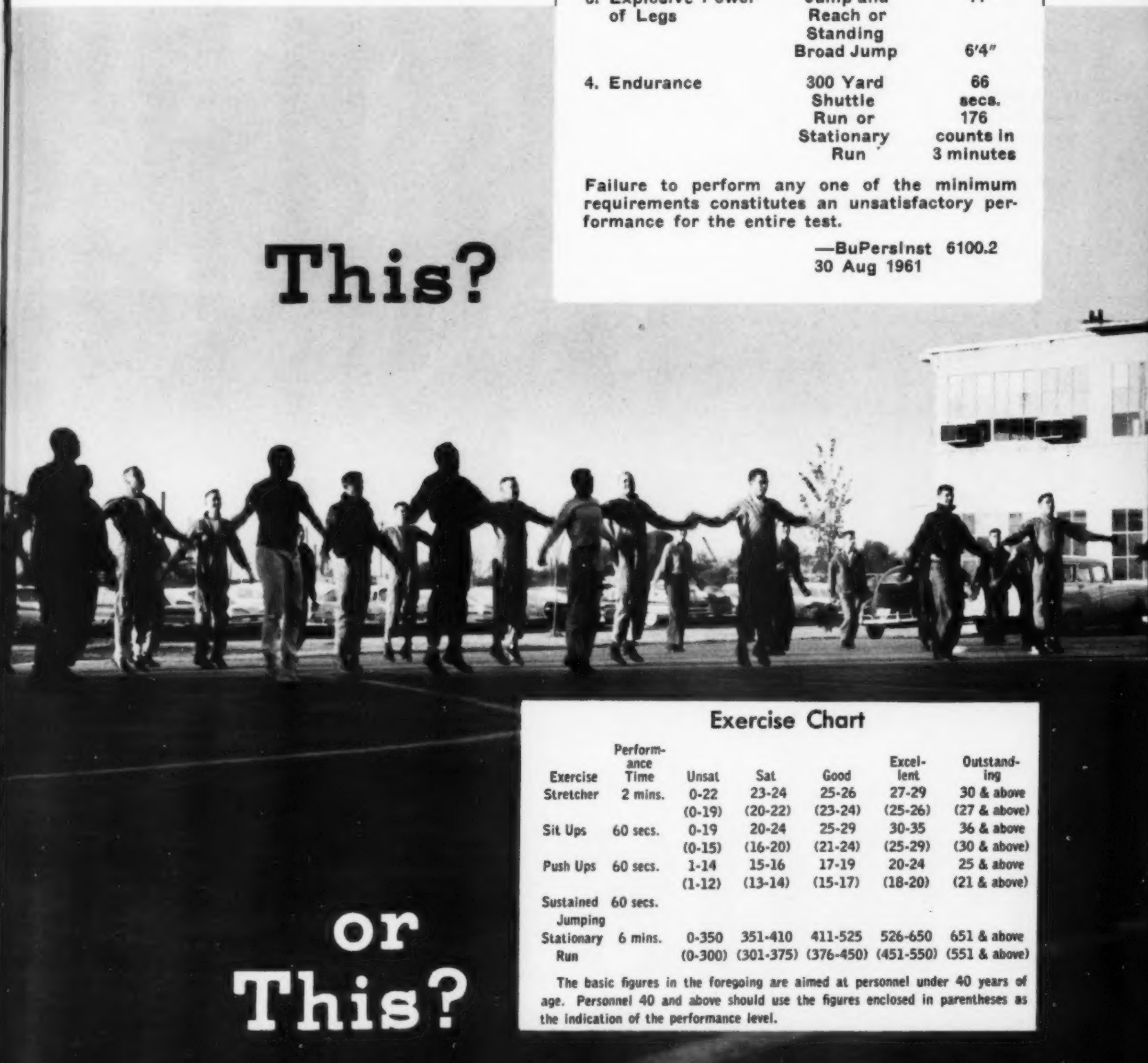
The following are the minimum physical achievements required of all male Navy personnel under 40 years of age.

Category	Requirements	Minimum Performance
1. Arm and Shoulder Strength	Push Ups or Pull Ups	15 3
2. Abdominal and Trunk Strength	Sit Ups	25
3. Explosive Power of Legs	Jump and Reach or Standing Broad Jump	11″ 6′4″
4. Endurance	300 Yard Shuttle Run or Stationary Run	66 secs. 176 counts in 3 minutes

Failure to perform any one of the minimum requirements constitutes an unsatisfactory performance for the entire test.

—BuPersInst 6100.2
30 Aug 1961

This?



or This?

Exercise Chart

Exercise	Performance Time	Unsat	Sat	Good	Excellent	Outstanding
Stretcher	2 mins.	0-22	23-24	25-26	27-29	30 & above
		(0-19)	(20-22)	(23-24)	(25-26)	(27 & above)
Sit Ups	60 secs.	0-19	20-24	25-29	30-35	36 & above
		(0-15)	(16-20)	(21-24)	(25-29)	(30 & above)
Push Ups	60 secs.	1-14	15-16	17-19	20-24	25 & above
		(1-12)	(13-14)	(15-17)	(18-20)	(21 & above)
Sustained Jumping	60 secs.					
Stationary Run	6 mins.	0-350	351-410	411-525	526-650	651 & above
		(0-300)	(301-375)	(376-450)	(451-550)	(551 & above)

The basic figures in the foregoing are aimed at personnel under 40 years of age. Personnel 40 and above should use the figures enclosed in parentheses as the indication of the performance level.

Frostbite is a possibility in a number of aviation situations —in the low temperatures found in high altitude ejection, in early parachute opening at high altitude which slows descent, in explosive decompression, on the flight line and flight decks in cold and wind, in survival situations in life rafts and on land in northern regions. There has even been a case of frostbite reported in the cockpit of an A3D-2 when the cabin heating system failed.

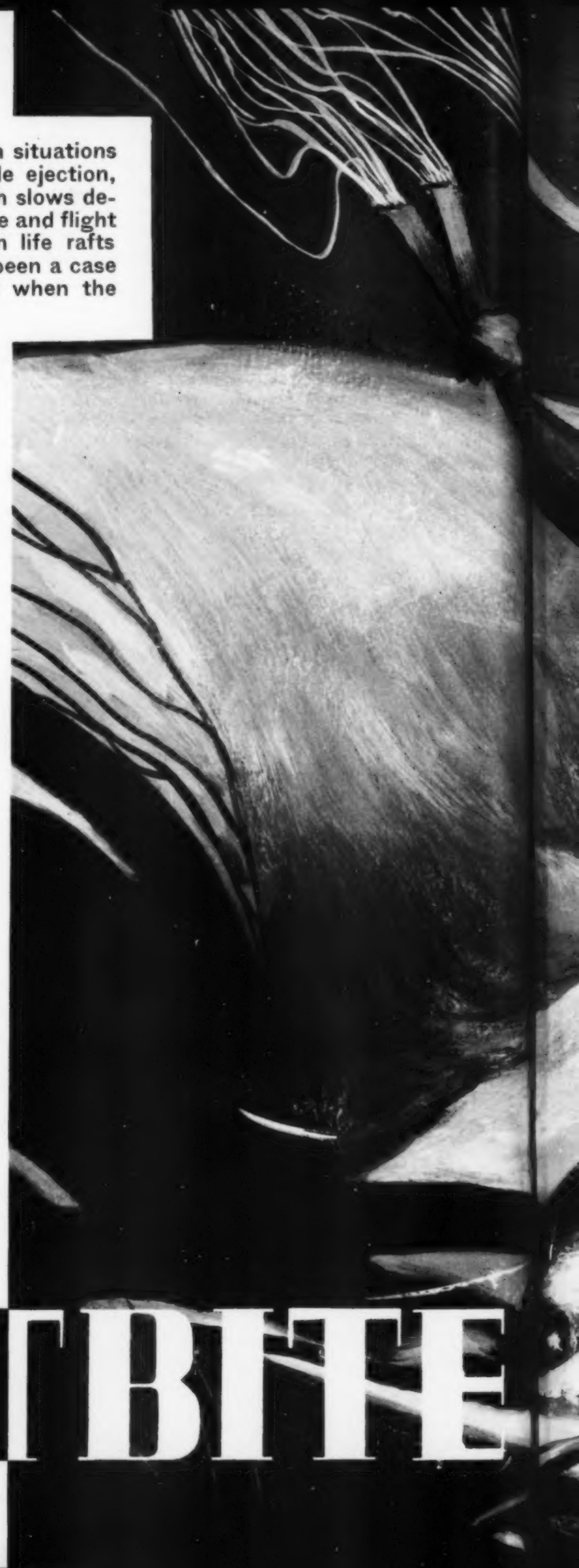
FROSTBITE is caused by exposure to severe cold, particularly in wind. Contributing factors are loss of body heat and decreased blood circulation which can occur naturally or result from overtight clothing.

Symptoms are often mild and transient— often slight stinging or tingling, prickling and numbness rather than actual pain. The involved area loses feeling and turns white, waxy and ultimately becomes solidly frozen.

It is easier to prevent frostbite or to stop it in its very early stages than to thaw and take care of badly frozen flesh. The following precautions apply mainly to non-flying personnel working on land and aboard ship.

- Dress to protect yourself against cold and wind.
- When exposed to aircraft prop blast, protect your face in cold weather.
- Keep dry. If you get wet, change clothes as soon as possible.
- Avoid warming the body to perspiration level. When you work, keep your clothes loose to allow free circulation of air which keeps them dry.
- In extreme low temperatures, be careful not to touch metal with your bare skin.
- Try to keep hands and feet dry.
- To prevent frosting by condensation from breath, do not bind a scarf or parka close about your face.
- In survival situation when making shelter and fire for warmth remember that clothing keeps heat out as well as in. Men have been seen to set their boots smouldering while complaining that the warmth of the fire was not helping their cold feet. Remove outer garments for rewarming and gently

Continued



FROSTBITE

ON a cold January night, an F9F pilot became disoriented on a routine tactics flight over Missouri and ejected at 25,000′ manually actuating his parachute at 20,000′. The temperature was a cold —32°C. He was wearing an APH-5 helmet, summer flight suit and jacket, an anti-G suit and summer flight gloves. His winter gloves were inside his jacket but he was unable to get to them because of his parachute harness straps. He had on Marine field boots with two pair of socks, the inner, nylon and the outer, woolen.

During parachute descent, his hands became numb and very cold. He loosened his jacket and put his hands inside against his chest.

A six-inch snowfall covered the field in which he landed. "I wanted to lie down and rest but I knew I would never be able to get up so I thought things over and slowly walked about $\frac{1}{4}$ mile to the nearest farmhouse," he said. "When I got there, I kicked on the door until finally a man came and let me in. . . ."

The pilot sustained mild exposure and frostbite of the fingers of both hands.

massage feet while changing to dry socks if possible.

If you are working with others, watch their faces for white, waxy frozen spots and have them watch yours. If you are by yourself, "make faces" from time to time and touch your face to test for numbness and stiffness. To maintain good circulation in your ears, move them with your hands now and then. Wiggle your fingers and toes to keep them warm and to detect any numb or hard areas. Thaw any frozen spots immediately, using your bare hands or other sources of body heat.

Contrary to the slow thawing methods formerly recommended for frostbite, medical authorities today advocate rapid thawing of frostbitten tissue in warm water. Extreme care must be used in applying warm water as the numb, frozen tissue can be severely injured by applying too much heat. If no warm water is available, wrapping the frostbitten area in heavy fabric and applying heat packs is effective.

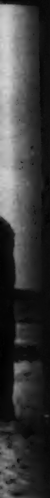
When frostbite is slight or when other methods are unavailable, the frostbitten area can be thawed with body heat—you can thaw your nose or ear with your bare warm hand or thaw frostbitten hands by placing them against your chest, between your thighs or under your armpits.

- Don't forcibly remove frozen shoes, mittens or clothing. Thaw them first.
- Don't rub or exercise a frostbitten area. This can tear and bruise the skin and cause further tissue damage.
- Never apply snow or ice to frostbite. This causes more cold injury.
- Never soak frozen toes, fingers or limbs in gasoline or kerosene. This causes more cold injury and irritates the skin.
- Prevent secondary infection by keeping the frostbitten areas clean and dry.
- Seek medical advice as soon as possible.

FOLLOWING a midair collision over South Carolina in December an FJ-3 pilot's statement read as follows:

"I must have been pretty high—about 30,000'—when I actuated the parachute because by the time I got to the ground my hands were like icebergs. I did not wear gloves on this flight. The rest of my body stayed relatively warm. After hitting the ground I had to wait for about 10 minutes for my hands to thaw out before I could undo my parachute harness."

The pilot didn't speculate on what would have happened to him with his numb, frostbitten hands if he had descended, as did the other pilot involved in the midair, into a nearby deep water lake.



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notes from your FLIGHT SURGEON

Bumps Canopy in Flight

AT the end of an instrument training flight, the two FJ-4s made a letdown from 30,000 feet at idle power and an indicated mach of 0.8 or less.

Upon passing 10,000 feet, they gradually transitioned to level flight resulting in a lower airspeed. The aircraft were in lower formation as they had all but leveled out at 4000 feet when they encountered one severe gust. *Because his seat belt was not tight and because of the severity of the gust, the pilot of the No. 2 aircraft was pitched up into the canopy with a force which stunned him and broke the visor shield on his APH-5 helmet.* Reflex recovery efforts on his part increased the pilot-induced oscillations to sufficient magnitude to register plus 10 and minus 4 Gs on the accelerometer.

Following the recovery from the oscillations, the aircraft was inspected by the No. 1 pilot. No discrepancies were found and they landed normally.

Had the pilot kept his seat belt tightened properly with adequate helmet-to-canopy clearance, it is believed that he would not have been stunned or at least the pilot-induced oscillations would not have been as severe.

Moving Violation

Leaving a moving aircraft in violation of squadron safety regulations shows poor judgment and training. The results can be tragic.

A duty line structures mechanic aboard an A3D being towed to the parking line exited through the lower escape hatch to assist in chocking the aircraft. As he dropped to the ground, he stumbled over a coil of tie-down lines and was knocked to the pavement. His head hit the aircraft spoiler rake. He tried to roll clear of the aircraft but the starboard main mount ran over his legs. His injuries were so severe that his left leg had to be amputated below the knee.

The mechanic stated that he vaguely recalled reading the squadron instruction which prohibits entering, exiting or climbing on an aircraft without permission of the plane captain once towing operations have commenced. He stated that on numerous occasions as the aircraft neared the parking site he had left it to assist in the chocking; he did not recall being reprimanded for this safety violation at any time.

Recommendations on the accident report called for more emphasis on education and training and increased supervision during routine operations.

"This accident," the reporting flight surgeon comments, "is an example of a good sailor who in his effort to assist and expedite routine operations dismissed safety for speed."

High Pressures

A LINE troubleshooting crew was filling a nose gear tire with an air compressor. After attaining what was estimated to be the proper inflation pressure one of the two men involved shut off the compressor. As the second man reached for the servicing line to disconnect the air servicing fitting the wheel exploded. The wheel rim severed his left arm at the elbow and fractured both his legs.

Investigation showed that members of the maintenance crew were habitually using the high pressure side of the air compressor to service the F11F-1 nose gear tires faster. This practice was against squadron maintenance instructions.

The need to expedite maintenance work is not justification to use procedures that can cause death or injury.

—Medical Officer's Report

No Harnesses

WHEN a WV-2 crashed on landing after an unsafe gear indication, neither the pilot nor the plane commander riding in the right seat was using his shoulder harness. The reporting flight surgeon states that use of this equipment would have prevented the pilot's injuries and reduced those of the plane commander.

Extra Cushions

IT HAS been reported that pilots are using extra cushions for personal comfort and visibility requirements in aircraft equipped with ejection seats. In the event of ejection, this "local fix" can easily result in a serious back injury.

Because the cushion compresses easily, the ejection seat and the occupant will not begin accelerating at the same time or at the same rate. This difference, although measured in fractions of a second, will result in the ejection seat delivering a tremendous force to the pilot's spine, with resultant back injury. For this reason, extra cushions must not be used in aircraft equipped with ejection seats. When additional height is necessary, it is recommended that a wooden spacer be used. ●

BUBBLE TROUBLE

Canopies replaced in time
May save a neck;
A pilot's, yours or mine.

BUBBLE implosions and explosions are not uncommon and most of them could have been prevented by timely inspection and replacement.

A case in point is the pilot wearing his helmet visor in the up position who was struck in the forehead by fragments from the imploding bubble. His vision was restricted because of profuse bleeding from the three-inch gash but he managed to land his aircraft safely. Another pilot might not have been so lucky.

High speed aircraft such as the F8U, A3D, A4D and F3H are equipped with cast acrylic plexiglas. This plexiglas is noted for its high degree of notch-sensitivity. It is highly susceptible to cuts, nicks, scribe marks and scratches.

Canopies for newer aircraft such as the A2F and F4H are being equipped with stretched acrylic, a type of plastic which, before being shaped, is pulled in both directions to rearrange its molecular structure. Stretched acrylic panels have a greater resistance to impact, less shatter, its chemical resistance is greater, edging is simpler, has greatly reduced notch sensitivity and crazing and scratches are less detrimental. In short, the best fix known for cast plexiglas is the change to stretched acrylic plexiglas. Eventually other high speed aircraft will be similarly equipped with replacement canopies.

CRAZING AND FATIGUE resulted in shattering plexiglas at 25,000'.

MARTIN-BAKER equipped F8U experienced plexiglas implosion at 23,000'. Improper packing of drogue chute can cause misalignment of drogue scissors (indicated by arrow) and canopy interference.

But it will be some time before enough of the new type panels get around. In the meantime we will have to learn to live with the old type canopies.

Service Damage

Service damage is the main cause of plexiglas failures. Reports include:

Ejection Seat Height—Some seats can be raised to a height which interferes with canopy.

Ejection Seat Downlocks—Downlocks have failed allowing the seat to rise and strike the canopy during catapult takeoffs.

Drogue Chutes—Improper packing of the Martin-Baker drogue chute can cause the drogue scissors shackle to interfere with the canopy.

Cabin Overpressurization—The combination of pressure regulator malfunction coupled with a defective cabin pressure relief valve and a plexiglas flaw will lead to a bubble failure.

Chemicals—Solvents, cleaning compounds, kerosene, gasoline, mineral spirits, paint, paint thinner and even paint fumes will craze plexiglas, reducing its transparency as well as its strength.

Heat—Overheating of areas by defective defogging equipment will weaken plexiglas.

Inspection Criteria

The high number of canopy plexiglas failures in flight coupled with a higher number of canopy replacements during Progressive Aircraft Rework (PAR) indicates operators are tolerating defects which involve safety of flight.

The decision as to whether or not a flaw or defect is allowable is often not clear cut. In such instances, sound judgment must be used. BuWeps put out the following information and criteria to help in making the decision:

(a) Cast plexiglas is rather brittle. Any flaw will weaken the plastic to some degree.

(b) The larger and more sharply defined the flaw, the more critical it is.

(c) The location of the flaw on the canopy or windshield may affect its seriousness. The area closest to the framing is generally the most critical.

(d) The size and shape of the canopy or windshield should be considered. Generally, a small part will be less critical because it has better support and has a smaller area exposed to local stresses or external damage.

Cracks—Any crack is reason for replacement.

Scratches—Occasional light scratches are allow-

PLEXIGLAS FAILURE led to loss of entire F8U canopy—note caution to position headrest for canopy clearance.

able even if detectable by thumbnail, if they are well separated, are more than four inches from the mounting, and do not interfere with vision.

Caution—If periodic inspection reveals a tendency for otherwise allowable scratches, crazing or other defects to grow, the part should be replaced.

Scribe Lines—Upon receipt of a new aircraft or installation of a new part, a one-time inspection should be conducted to be sure that a scribe line does not exist. Presence of a scribe line is reason for rejection of a panel. A scribe line may result from removal of a spraylat-type protective coating, in which case it may occur at any position, or it may occur at the juncture of the plastic and edge material. In the latter case care should be taken not to mistake a glue line for a scribe line. A glue line is not reason for rejection. A ten-power glass will aid in determining whether a glue line or a scribe line exists.

Canopy Care

In light of the type of service damage which is occurring the following action by mechanics is recommended:

Ejection Seat Height—Adjust seat and headrest so adequate clearance is maintained between the canopy and seat.

Ejection Seat Downlocks—Inspect same for condition in accordance with the applicable Handbook of Inspection Requirements (HIR). Insure that the downlock mechanism is properly secured.

Drogue Chutes—Insure packing is in accordance with current instructions.

Cabin Overpressurization—Test cabin pressure regulator and safety valves for proper performance. Insure that static ports and sensing lines are open.

Heat—Monitor the operation of defogging equipment in accordance with applicable Handbook of Maintenance Instructions.

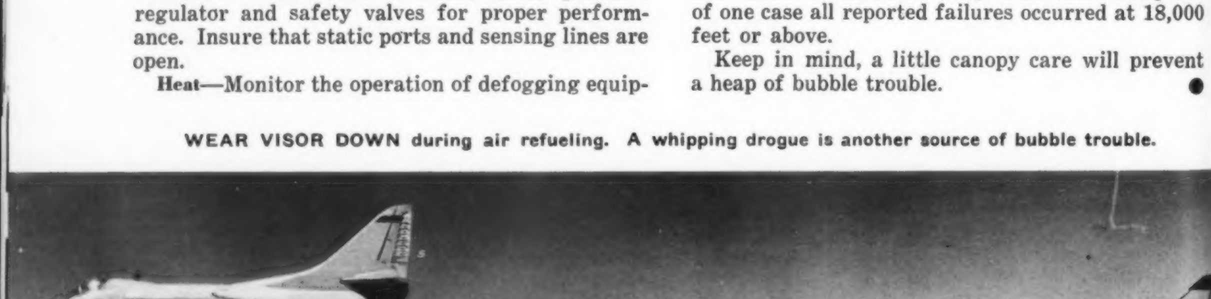
CANOPY CARE can prevent bubble trouble.

Solvents—Don't use these for cleaning panels. One drop of solvent can do more damage than years of aging. Wash the plastic with a mild soap and water using a soft cloth. Wipe down with a chamois. If you wear a ring, take it off to avoid the possibility of scratching the plastic.

- Pilots are advised to fly with their visors down when conditions permit.
- Care must also be exercised when adjusting seat height to insure adequate clearance between the canopy and seat and that downlocks are properly engaged.
- Monitoring of the cabin pressure altimeter during climbout and letdown will possibly give a clue to a malfunctioning regulator or pressure relief valve. It is noteworthy that with exception of one case all reported failures occurred at 18,000 feet or above.

Keep in mind, a little canopy care will prevent a heap of bubble trouble. ●

WEAR VISOR DOWN during air refueling. A whipping drogue is another source of bubble trouble.



THERE has been a noticeable letdown in the squadron safety attitude since the return from deployment. Many of the ground safety violations that were eliminated before the last deployment have returned to haunt us. Many of the "old hands" are not setting the example that they should. The new people joining the squadron must be correctly indoctrinated as to proper safety procedures. Don't let your attitude be—"if the Safety Officer isn't watching, it is O.K. to do it." Here are some of the ground safety violations that I have observed; you probably have seen many more:

- Using boxes for workstands.
- More than one man on a mule.
- Improper securing of aircraft.
- Walking through propellers.
- Towing aircraft without safety watches.
- Leaving batteries connected when the plane is in the hangar.

As I said, these are just a few, let's eliminate them all.

Plane Commander Procedures

The Plane Commander or the pilot in command has his work cut out for him during this period also. New pilots are reporting aboard. New aircrewmen require training. The professional pilot follows taxi signals, insures that his crew knows their ditching and bailout procedures, and teaches new pilots the standard way of doing things. Doctrine must be followed. Some of the safety procedures that pilots have been violating are as follows:

- Using intermittent prime to start aircraft.
- Taxiing too fast.
- Not using the Command-Reply system when using the check-off list.
- Improper flight gear (low cut shoes for example).
- Moving switches while still on the landing roll.

Squadron doctrine says that *no* switches will be moved while the aircraft is on the landing roll. Cowl flaps and oil cooler switches should not be opened and the flaps should not be raised until the aircraft is clear of the runway. Check the new pilots out right.

UHF

When do you shut off the UHF after returning from a hop? As you enter the line or after the engines are shut down? Your answer should be "after the engines are shut down." Until the aircraft is secured you are in a position where a radio might be needed. If you had a taxi accident, a quick call to the tower would send the crash crew. If someone walked into a prop, another quick call and an ambulance would be on its way. Don't cut yourself short, keep your UHF on until the aircraft is completely secured.

Another episode attesting to the unreliability of PENCIL CHECKS

AT approximately 100′ immediately after takeoff, both pilots of a T2J heard a rumble in the engine, followed by excessive EGT, fire warning light and loss of thrust. The pilot in command, who was in the rear seat, took control, retarded throttle, dropped the tail hook and landed straight ahead.

Unbeknown to the rear seat pilot, the pilot in the front seat, who made the takeoff, had raised the landing gear just after becoming airborne. Therefore the plane settled back on the runway

Air intake duct cover was found lodged against bearing support strut

minus the landing gear and slid off the end of the runway where it engaged the overrun barrier.

Upon investigation an air inlet duct cover was found lodged over the starboard bottom section of the compressor inlet. Although it was not determined who had placed the duct cover in the air inlet duct, some interesting findings were brought to light concerning aircraft preflighting.

It became obvious that a careful preflight had not been performed by the plane captain. Tests conducted afterward proved that an air inlet duct cover could not be placed, or hidden in the T2J-1 air duct to preclude discovery if normal preflight methods were observed.

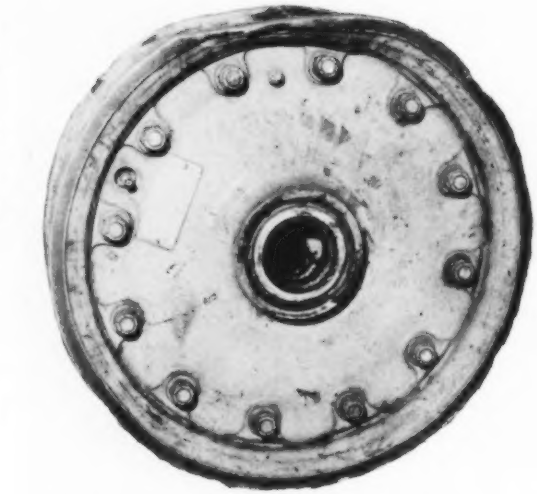
The daily inspection check list covers 163 items for the T2J. The preflight check list covers 86 items. Both lists cover inspection of the air intake ducts and engine compressor inlet section for foreign objects and damage. This was not done by either of the two plane captains who preflighted the plane.

When the aircraft was towed from the hangar to the line one of the plane captains removed *one duct cover*. He did not mention the absence of the other duct cover to either pilot.

The pilots gave the aircraft the normal prescribed pilot preflight *except for a careful air intake duct check*. The pilot stated, "If I had had a flashlight I might have been able to see the duct cover somewhere within the duct."

In analyzing the accident it was found that the two plane captains had conducted the entire 163-item daily preflight *without the use of the check sheet*. Furthermore it was determined that this had apparently been standard procedure as there was no compunction on the part of the plane captain to return to the line shack, fill out the check sheet and sign it. No one questioned this procedure. In allowing such a slipshod method of preflighting to exist it was obvious that there was an almost complete lack of supervisory control.

The board recommended that supervisors stress the importance of the daily and preflight inspection form and insist upon its use at the actual scene of inspection. In addition it was stressed that whenever two persons conduct a preflight the Challenge and Reply System be used while utilizing a prescribed preflight check list.



Aluminum wheel after two landings without a tire.

Consumer's Report

TWO carrier landings on a bare aluminum wheel convinced members of VF-24 of the wheel's superiority over the magnesium wheel.

An unscheduled test came about when an F8U blew a tire during a catapulted takeoff. The tire left its wheel as the aircraft became airborne. A hook skip and bolter was followed by a successful arrestment.

Investigators stated it is doubtful that a magnesium wheel would have taken the bolter and arrested landing without possibly shattering and causing further damage. The board endorsed the aluminum wheel by stating that enough wheels should be installed into the supply system to eventually replace all F8U magnesium wheels. The tire was lost and the reason for blowing is unknown.

Mismated Coupling

DURING a routine turn-up of an F8U a fire developed in the tailpipe area, the engine was secured and the fire extinguished. Investigation revealed that a fuel leak existed in the fuel vent line coupling at the tail break. The coupling had been mismated and forced to fit during previous installation of the tail section.

This aircraft had just been recently received from O&R and was in the final phase of acceptance check. Total cost for repair work on this needless accident was $27,500. There is no substitute for good workmanship and a job conscientiously performed.

Canopy Losses

THE following is quoted from the AAR Analysis of a recent accident: "The practice of installing the nuts and bolts in the canopy latch assembly without the aid of a torque wrench has been discovered in this squadron. It is the opinion of the board that this practice is evident throughout the naval aeronautical establishment. Since upon investigation of the canopy latch assemblies of other F4D aircraft in this squadron evidence of similar malpractice was brought to light in every case. Furthermore, F4Ds from a different squadron were inspected and the bolts and nuts of the canopy latch assemblies showed evidence of overtorquing and/or cross-threading in the majority of aircraft aboard. This squadron's complement of F4Ds is made up of aircraft that have been in every F4D squadron on the East Coast and most have been through PAR."

NASC considers this a probable explanation of heretofore unexplained canopy losses and appreciates VF-101's candid reporting and excellent investigation.

J57 Pump Trouble

Overhaul activities report that disassembly and examination of five J57-P10/and P8B engines disclosed that the no. 6 bearing oil suction pump had sustained severe damage. In all cases the pumps had apparently been disassembled and reassembled incorrectly. The no. 4-½ bearing oil nozzle, part no. 196781C, had been installed on the outside of the pump cover plate, part no. 307795, instead of into the housing prior to installation of the plate.

When the nozzle is incorrectly installed in this manner, the shoulder on the nozzle causes the pump to cock on the mounting flange in the housing weldment, part no. 323321, and the shaft to fail due to misalignment, internal binding and gear tooth interference. Misalignment further results in severe wear to the oil nozzle due to contact with the rotating turbine oil tube assembly, part no. 318271, and possible contamination of the no. 4-½ bearing and seal assembly.

Overhaul activities are cautioned against the possibility of incorrect reassembly of this part.

Loose B-Nut

DURING the second slow time flight the TF's pilot noted excessive fuel consumption in the starboard engine. He elected to return to base and investigate the difficulty. During the final the

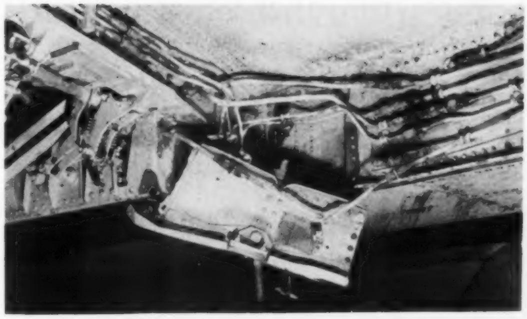
crew heard a muffled explosion and discovered the starboard engine was on fire. The pilot secured and feathered the starboard engine, completed his landing and activated the fire extinguisher system. By the time the landing roll was completed the fire was out. No damage, other than limited fire damage, resulted.

Investigation revealed the B-Nut on the main fuel line from the fuel pump to the carburetor, on the carburetor end, was loose allowing fuel to spray into the accessory section. The nut was backed off more than one turn and this condition was not due to overheating.

The in-flight fire resulted from aviation fuel being sprayed into the accessory section of the starboard engine due to the loose B-nut on the main fuel line.

It is recommended that inspectors conduct thorough inspection of maintenance performed to insure that all fittings are properly torqued.

JET-CAL COMMUNICATIONS—VA-12 extends the use of sound power during jet-calibration by adding two outlets to the normal two-man rig allowing new mechanics to hear what's going on during the noisy operation. By splicing the communications cable or using a central jack, VA-12 now has an improved jet-cal capability that is safer and more effective, is an efficient training aid and provides improved quality control.—LT T. P. SCOTT, Safety Officer



Wing tie-down assembly tore from its mounting during inflation of strut.

Explosive Situation

This F3H-2 was undergoing a major periodic inspection. The main landing gear struts had been disassembled, inspected, reassembled and installed on the aircraft. Just prior to the accident, the upper (external stores extension) chambers of the main landing gear struts were inflated (about 7 inches of oleo showing). Preparations were then made to inflate the lower (shock absorption) chambers, but at this time the air compressor being used ceased to function properly.

The aircraft was then tied down, using the wing tie-down rings (two chain type tie-downs were attached to each wing tie-down), and the ship's V-6 Division was notified to repair the compressor. The compressed air line was left connected to the lower chamber of the starboard strut.

In the process of repairing and checking the air compressor, mechanics opened the compressed air valve, inflating the lower chamber of the starboard strut, inflicting the damage as follows: The starboard wing tie-down assembly was torn from the aircraft except for a few rivets. The hydraulic line to the starboard brake was broken and other hydraulic lines were bent. The upper brace of the port wing tie-down assembly was bent and the lower panel was torn. See photo.

Both port and starboard wing tie-down assemblies, with the exception of tie-down rings and braces had to be replaced.

Cause: Failure to disconnect the air compressor, and improper testing procedures after performing maintenance on it, along with improper tie-down procedures.

Comments and recommendations of the Board:

- Wheel tie-down rings be used to tie down an aircraft while servicing struts.
- The compressed air line be disconnected from the struts whenever the air compressor is not actually in use.

No Danger If Care Is Used

Some J79 engine parts are made from magnesium-thorium alloys. The parts include the gearbox casings for the J79-8 and the front stator cases for J79-5, -5A, -5B and -7 engines, and left and right side supports, 304D912P2, on FRG engines. Thorium is a naturally existing radioactive material and because of this radioactivity, shipping cases containing spare parts are marked "Radioactive—Danger."

No real danger exists except during working of the material and a few simple precautions will even eliminate these possibilities.

AF T. O. 00-110N-4 has this to say about these alloys:

"Magnesium-thorium alloys are being used in Air Force (and Navy) weapon systems. Thorium is an alpha-radiation-emitting element and thus potentially hazardous. When alpha-emitting particles enter the body either by inhalation, ingestion or through an open wound, a health hazard may result, the seriousness of this hazard being in relation to the amount and type of alpha emitter taken into the body. The quantity of thorium present in the magnesium-thorium alloy is of the order of 3 to 4 percent. This low percentage of thorium is locked up physically as an integral part of the magnesium alloy and as such does not carry the same characteristics as pure thorium. Due to the small amount of alpha radiation resulting from the alloy, there is virtually no external radiation hazard, but repeated exposure to dust or fumes from grinding, welding or similar operations can be harmful to the body. Observations of the precautionary measures outlined in this technical order will ensure safe working conditions for personnel using this material."

Parts made of magnesium-thorium alloys may be stored and handled with no danger to your well being. If the parts are to be worked in such a way as to produce dust or fumes, refer to the previously mentioned technical order or other applicable instructions for the proper precautions to be taken. *GE Jet Service News*

Night Lifesavers

Mae west one-cell flashlights are recommended for use on the flight deck at night. These flashlights with red lenses can be pinned on your clothing and do not interfere with your work. If you fall and become injured or have any difficulty, the red light marks your position NOW. One man was injured at night and was not discovered for a few minutes even though he had been thrown flat on the deck. Use the one-cell flashlight if you work on the flight deck at night.—*VF-74*

DROGUE GUN COCKING

An AAR reports ejection fatality due to failure of drogue gun to fire and notes that the F8U Handbook Maintenance Instructions contains an erroneous statement (P 113, Para 351 BP) as follows: "Note—firing mechanism is cocked if sear is in position and safety pin is or can be installed." This is incorrect as safety pin can be installed in uncocked gun.

As drogue gun failure was probably due to gun being installed uncocked, above statement may have misled maintenance personnel and contributed to maintenance error. In viewing this possibility recommend deletion of above statement from F8U HMI. *ComNavAirPacMsg 042133 (Aug 61)*

Probe and Drogue

The A4D's hose was extended at 220 kts, 25,000' for aerial refueling of four F3H-2N aircraft. EXTEND-RETRACT indicator indicated RET even though the F3H pilots confirmed full hose extension. Airspeed was increased to 260 kts in an effort to obtain extend indication with no success. Tanker pilot elected to conduct operations so speed was reduced to 240 kts and an F3H commenced plug-ins. The first plug-in caused a large slack in the hose which whipped in the airstream and subsequently separated from the paradrogue at the connection The paradrogue remained on the probe of the F3H. No further damage occurred. Both the tanker and the F3H were landed without further incident.

The accident board stated this hazard stemmed directly from the failure of maintenance personnel to remove the snubber pin from the refueling store prior to flight, coupled with the tanker pilot's decision to conduct operations with other than normal indications on tanker control console. The snubber pin is installed during ground operation of the store to restrict rotation of the reel assembly in order to facilitate ground testing. Furthermore the pin was not available and a wire with *no red flag* was used in its place.

Because of the electrical design of the store it is impossible for the tanker pilot to receive an EXT indication, even though the hose is fully extended, when the snubber pin is installed. Should a plug-in be attempted under this condition a sub-

stantial degree of slacking of the hose will result because of reduced tensioning action. Severing of the hose due to slipstream whip usually follows.

Recommendations:

1. Snubber pins (configured with a red flag) be faithfully used by buddy store technicians.
2. Plane captains and pilots be required to remove the buddy store access plate and insure that the snubber pin is removed prior to flight.
3. Preflight checklists be utilized by refueling store technicians.
4. Pilots be cautioned not to operate the store unless all tanker control console indications are normal.

The pilot made a normal field landing, leaving his aerial refueling probe extended. He then requested that the station crash crew remove the paradrogue from the probe, with the aircraft engine still running. Had the pilot secured the engine, the refueling probe would have automatically retracted, as soon as DC electrical power was lost, regardless of the position of the fuel selector switch. Retraction of the probe with the paradrogue attached would undoubtedly have damaged the starboard cockpit windscreen panel. It is recommended that this fact be brought to the attention of all F3H squadrons.

—D. D. Smith, Safety Officer, ATKRON 192

Oil & Water in MB Cats

OIL and water accumulations in Martin-Baker ejection seat catapults have been reported in numerous instances. It was noted that guns without seals part no. MBEU 18160, installed in all cases had accumulations of water while guns with seals had condensation in varying minute quantities.

If daily inspection reveals accumulation of liquid in bottom of the inner catapult tube, remove liquid, extend catapult tubes and remove excess oil in accordance with Handbook of Maintenance Instructions.

Because the present F4D HMI lacks instructions on catapult servicing the use of the HMI on any other Martin-Baker seal for the F4D seat is recommended. Action is underway to include catapult instructions in the F4D HMI.

Maintenance personnel are cautioned that during catapult servicing excess oil must be wiped from catapult tubes prior to assembly. This action insures that oil does not run down catapult tube and pool in the bottom. Presence of water in catapult tubes indicates that water is not being sponged out from around the firing mechanism prior to cartridge removal.—*BuWeps msg 262047Z July 1961 and MarAllWeaFitRon 114 281510Z*

A MAINTENANCE OFFICER SPEAKS

THE only means by which I can maintain contact with most of you is through the aircraft Yellow Sheet.

Actually, the large majority of the pilots who fly the Station Administrative and CRT aircraft do a splendid job of filling out the Yellow Sheet, specifically part B.

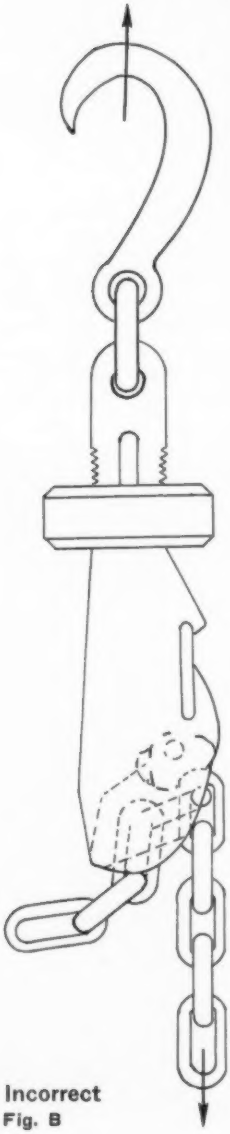
Lately, however, I have noticed a tendency for a few of you to become slightly negligent when you return from the last strenuous leg of an extended cross-country flight and list all of the discrepancies that have accumulated since your departure from Ye Auld Home Base. Some of these discrepancies are downing ones and have existed since that first leg of your journey, according to your write-up.

Do you think it wise to fly several more legs of that journey with these downing discrepancies, and then *admit* that you have done so when you fill out your Yellow Sheet when you arrive at Home Base?

It looks slightly ridiculous for the downing discrepancies to be noted as such on the sheet covering the first leg of a journey, and a downing arrow circled on that sheet, and then have no write-off on the correction side of the sheet before the aircraft has flown on a subsequent leg. From the looks of things, *you are flying a downed aircraft.* Not only is this foolhardy, it is also *not legal*!! In addition, if work has been accomplished on your bird while you were transient at another base, I have a need to know just what was performed. Perhaps a logbook entry is required, perhaps a follow-up is called for if there is evidence of poor maintenance practices or poor quality control. If *you* think that *you* may be lax in the way that *you* fill out *your* Yellow Sheet after a flight, I request that *you* review the instructions that are in print on the form itself.

Yours truly for the best flying, *better* discrepancy write-ups, and the *best* of maintenance!!—*Alameda Operations Newsletter*

TIE-
THE PROPER USE OF
DOWNS



A BuWeps survey of Fleet activities utilizing the 10,000-pound capacity, FSN R1730-572-7370-3030 tie-down was initiated to determine the reason(s) for the seemingly excessive attrition rate and the predominant causes of failures.

Evaluation of the reports received by BuWeps indicate that breakage of the quick release tab and the chain retaining lock (not chain pocket) are the major items that fail.

The release tab, due to its location and composition, is inherently subject to failure, but it is believed that the chain retaining lock, which is designed only to retain the chain in the pocket during tensioning operations, will not fail unless subjected to adverse loads. These loads can be imposed by inserting the chain in the pocket so that the load is not transmitted along the centerline of the tensioning mechanism (note illustrations).

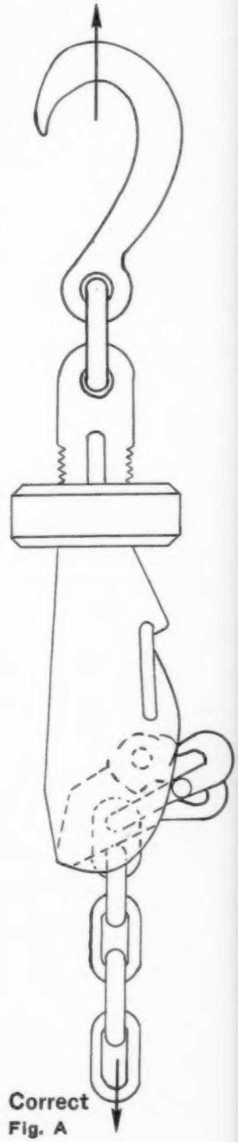
The TD-1/TD-1A tie-down assembly is composed of a chain assembly and a lock mechanism, each having a hook at one end. The two separate assemblies are joined to form an integral unit by inserting any one of the chain links into the locking device.

The chain should be installed so that the load passes through the centerline of the lock mechanism as shown in Figure A. This utilizes the full design strength of the lock. It is possible to install the chain improperly so that the load is off-center as in Figure B. With the chain installed in this position the working load is reduced to about 6000 pounds.

Preload is accomplished by rotating the tensioning nut on the threaded shaft of the lock mechanism. A preload of approximately 750 pounds must be obtained before the nut bottoms on the last thread.

The chain link lock is susceptible to accidental release. For this reason, the hook on the lock mechanism should be installed on the aircraft ring where the lock is off the deck. ●

Incorrect
Fig. B



Correct
Fig. A

MURPHY'S LAW*

Upside-down MURPHY reported by Dr. Konrad Strainer, Doctor of Maintenance, AES-12, Quantico.

Case in point: Incorrect installation
Aircraft in point: T-34B
Item in point: Landing Gear Switch assembly.
Trouble in point: During maintenance of the rear cockpit instrument panel, the (Item in point) landing gear switch assembly was removed to facilitate maintenance of the panel assembly. The switch assembly was still wired and dangling until re-installation began. The electrician inspected the assembly for some indication of which way was right-side-up or upside-down. He found no such indication, so he placed the switch assembly into the instrument panel for a look-see and discovered that the wiring had taken on a twisted condition (often seen in Murphy's involving over and under hook-ups). Since the twisted wiring condition did not look "Kosher", the electrician reversed the switch, mounted it upside-down (unbeknown to him), secured his work and left the scene.

The next step inevitably happens with landing gear and/or its components that have been worked on. Power was applied to the aircraft—the aircraft was *not* on jacks—and began to settle (gear going up). The electrician "saw the light"! All power was cut off and jacks were installed (while 10 men held up the T-34.

Lucky it wasn't very heavy and Maintenance investigation proved the landing gear switch assembly (Item in point) was installed incorrectly (Case in point) on the T-34B (Aircraft in point) and caused the Trouble in point (gear collapse).

Preventive maintenance—*always* but *always* cycle the landing gear of all aircraft whenever *any* landing gear components are worked on! *On jacks, of course! ! !*

* If an aircraft part can be installed incorrectly, someone will install it that way!

KONRAD STRAINER,
Dr. of Maintenance
M. E. HOSEY, Capt., USMC
Maintenance Officer

LETTERS TO THE EDITOR

For 30-Hour Check

FPO New York—It is with great pleasure that I am able to report that the VALIONS of VA-15 reached 10,000 hours of accident-free flight on 27 July 1961 during the second day of operation Southwind while deployed aboard USS FRANKLIN D. ROOSEVELT (CVA-42).

As a component of Air Group ONE, VA-15 attained this goal (dating back to 11 April 1960) while making some 3025 carrier arrested landings. At this writing, VA-15 has also flown over 23,000 hours marked by only one aircraft accident. It is significant that 7764 of the 10,000 accident-free hours were flown from the carrier deck while deployed.

This squadron believes its safety record is directly attributable to superb maintenance and professional airmanship. The VA-15 Maintenance Department practices meticulous quality control, and has initiated a 30-hr. check, which is not required. In this way, minor discrepancies are detected before they become the cause of an aviation accident. It is significant that no accident involving maintenance error has occurred within this command for a period as far back as squadron records are available.

TED L. FARRELL
CO, VA-15

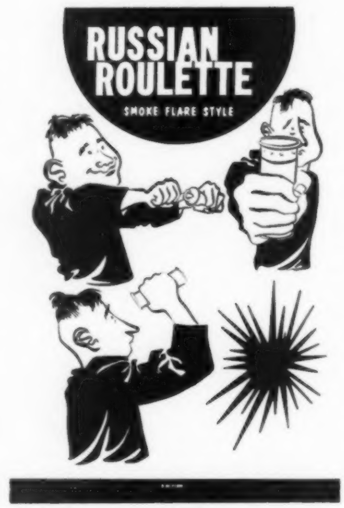
● **To this Approach adds a Well Done, VA-15!**

Poster Payoff

FPO San Francisco—In keeping with the request for information concerning any Safety Center publication that has prevented injury the following is forwarded:

A double flameout at low altitude in an A3D aircraft caused the entire crew to bail out some 15 miles short of the destination. Due to the nature of the mishap, no Mayday squawk or call was put out. The crew was, therefore, at the mercy of the sea which was rough with 14-foot swells. Because of local radar characteristics SAR was not alerted for nearly three hours. The pilot and I split a beer at a local BOQ bar recently and he related a portion of the incident that does not appear in the AAR.

When an Okinawan fishing boat approached, the pilot pulled the ignitor on his day smoke flare.



Voila! No smoke! As he gazed down the business end of the flare, he thought of that "crazy poster" (B60P1259) showing Russian Roulette, smoke flare style. The pilot immediately turned the flare away and sure enough—off went the flare!

L. S. KOLLMORGEN, LCDR

Chopper Pilot Owes Life to Chute

New York—With reference to the article "Parachutes In Helicopters?" by 1stLT Crognale in the Sep '61 APPROACH I can suggest that comments be solicited from those pilots who have bailed out of helicopters.

And I can suggest the name of one who has—the only man in the Coast Guard that has to my knowledge. He is John P. Greathouse, ADCAP, now stationed at the Coast Guard Air Station, Port Angeles, Washington. It was many years ago that he and an HO3S parted company. John's luck has always been good and sure enough he was wearing a chute on this flight. Fortunately, he was at a goodly altitude when the rotor came unglued and because of this he owes his life to that chute.

I flew my 1500 hours primarily in the UF. Here, of course, you couldn't wear the whole works but uncomfortable as the harness was, we had it on more than a few times. If I was voting, as an outsider looking in, I'd say that the chute should be worn in the chopper. The Coast Guard, I believe, has a policy that it shall be whenever the flight is planned to go to altitude and during all mountain ops, though, I think, none is required for instrument flight. It's a thought-provoking idea and policy or not, the pilot that wants to can wear it.

Why not?

J. A. PERKINS, LT
Com. 3rd Coast Guard Dist. (DCR)

● **APPROACH welcomes reports of experiences.**

APPROACH welcomes letters from its readers. All letters should be signed though names will be withheld on request. Address: APPROACH Editor, U. S. Naval Aviation Safety Center, NAS Norfolk, Va. Views expressed are those of the writers and do not imply endorsement by the U. S. Naval Aviation Safety Center.

Development Series

Cleveland, Ohio—Re your pages 24 and 25 of September 61—Attack Aircraft—could it be that you overlooked the BG-1, BF-2C, SBA-1, SB-2A,—

Still an excellent magazine.

CAPTAIN, USNR
(OVER 20)

● **Had planned to run second section (Part II) of "attack" aircraft *about* April 1962. Buffs may also anticipate probable follow-on of fighters, seaplanes, transports and utility aircraft as well. Generally these will be experimental or lesser known birds.**

Wheels-Up Saves

Moffett Field—An A4D was reported turning base with gear for a full stop. As the A4D made an approach to runway 32R with landing gear in the up position fixed field flares were fired by wheel watch Donald J. Allen, AN. A successful waveoff was executed by the pilot and a wheels-up landing was prevented.

H. E. THAYER

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Instrument Approach Plate Holder

NAS Miramar—Ever since the advent of the instrument letdown charts, aviators have had to make instrument penetrations under the unsatisfactory condition wherein the letdown plate was balanced/located/held in a position away from the instrument panel itself.

Pending a design breakthrough on this problem, Commander R. E. Custer, of this command has come up with an interim solution. The proposal is considered to have merit in that it:

a. is adaptable to other type Attack Carrier Air Group aircraft with slight modification.

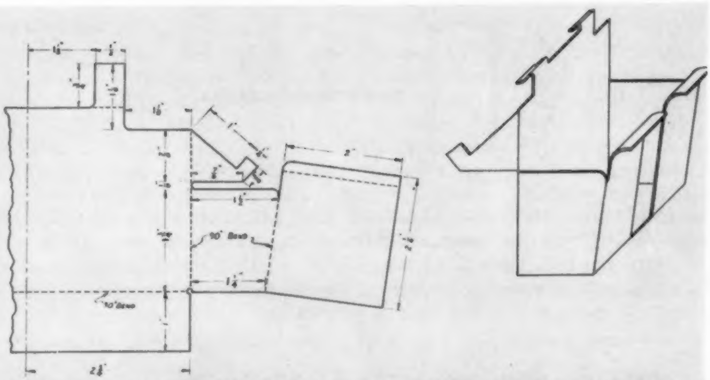
b. is inexpensive and easy to construct.

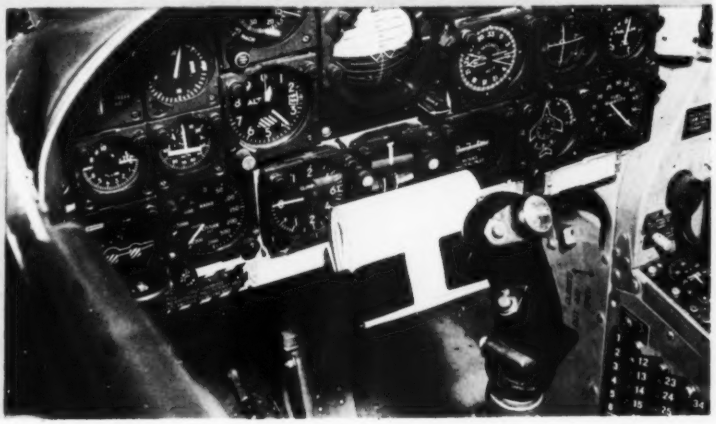
c. pilot can refer to the plate for desired headings, altitudes, . . . (after leaving the initial fix) without interruption to his instrument scan.

d. utilizes existing Flight Information Publication Terminal (High Altitude) Manual.

The obvious deficiency of the proposal is that only the glide slope profile section is readily visible to the pilot. The design of the holder partially overcomes this by ease of insertion/removal of the approach plate booklet.

J. R. SWEENEY
CAG-12





McDonnell Reprints "It's in the Cards"

St. Louis—McDonnell Aircraft has reprinted the "It's in the Cards" article which appeared in the September 1961 issue of APPROACH.

For the past two years, personnel of McDonnell's Maintenance Engineering and Support Department have worked very closely with Bureau of Naval Weapons and Fleet personnel in the development of the system for and the actual cards to be used in accomplishing scheduled maintenance requirements for the F4H. It is important that all those associated with the F4H understand this system of maintenance. With this idea in mind, personnel of McDonnell's Maintenance Engineering Department will conduct in-plant indoctrination courses for Engineering, Flight Test and Manufacturing personnel concerned with the various aspects of operation and maintenance of the F4H. Copies of this reprint article will be used to assist in this indoctrination program.

We wish to express our appreciation to APPROACH for granting permission to reprint and use this material.

R. E. PETERS
Assistant Manager Maintenance Engineering and Support

With the Season's Greetings . . . APPROACH reminds you the post-holiday return to a normal tempo of operations requires a planned warm-up...

LIFT and DRAG

NATOPS,  the first go-around

THE Naval Air Training and Operating Procedures Standardization Program is just cutting its teeth. Distribution has been completed on the first NATOPS manuals for approximately 15 models — with a total of 47 planned. You will recall first reading about the new program in the June '61 APPROACH. Full details are included in OpNav-Inst 3510.9

There was no pie in the sky attitude when this NATOPS Program was kicked off. Everyone knew that it was a crawling start and that the original manuals would require much revising. This could have been avoided by waiting another two or three years before finally getting the program started; however, it was felt by everyone concerned that anything out fairly soon would be better than a long delay.

In its role of father confessor to the fleet, APPROACH has received several comments and criticisms of the new manuals. Some of these — with names and places removed (in accordance with our usual policy) — have been forwarded to Op-56 for comment and for the good of the order. Here's the answer from the program honcho, Captain A. G. "Slim" Russell.

"Thank you for forwarding us the critical letter on the NATOPS manual. By coincidence, I flew down to CVG FOUR at Cecil Field yesterday and .... voiced very similar comments .... My immediate reaction to him was that the fleet assisted in the preparation of the manual and if the contents are weak the fleet must share responsibility. That is one of the beauties of this program . . . the users prepare the manuals and are responsible for the contents. However, these manuals were produced initially on more or less of a crash basis and there will be considerable room for improvement and letters of this type will result in said improvements.

"I suggest you publish this letter, ... Any good program must expect criticism. . . . I am sending a copy of the letter to Captain ...., (of the cognizant command — Ed.) and will suggest to him that it might be appropriate to call in the representatives (of this model) soon for a review of the handbook."

From the minutes of a recent San Diego Council meeting comes another comment:

"The rate for fiscal year '61 was 2.44, which is almost identical to the rate for fiscal '60. In the field of accident prevention, this indicates that a plateau has been reached which requires a good look at the factors which caused the accidents in order to find the areas of accident potential which require the most emphasis. Pilot and Material are still the leaders in cause factors. The NATOPS program will be a great asset in attacking the pilot factor problem and standardization of maintenance techniques will reduce the material factor by close scrutiny of the working parts of an aircraft. With these two tools, it is hoped that a reduction in accidents will occur during '62."

It is suggested that NATOPS manual readers forward as soon as possible, as many specific and constructive suggestions, evaluations, criticisms and questions concerning any model NATOPS manual to NATOPS Manual Coordinator of the appropriate command (see list below).

The full development of the NATOPS Program offers us great opportunities in finding better ways to further our combat readiness and reduce the loss of lives and equipment.

The Editors

CinCLantFlt			CinCPacFlt			CNATra	
*AD	HSS-1N	OE-1/2	*ADW	*P5M	HUK	*F9F-8/8T	SNB
WF	R4Q	S2F-3	*F8U	*HSS-1	HOK	*FJ-3/4	HO4S/HRS
*A4D	R4Y	R4D	F4H	*S2F-1/2	GV-1	F11F	/NTL
*F4D	R6D	P3V	*A3D	*FJ-4B	HSS-2	*T2V	*T-28
*F3H	HUP	A2F	F3D	HUS	W2F	T2J	T-34
A3J	HU-2K	TF	*R7V/WV-2	*HR2S	JD		
*P2V	HUL						

* Released or due to be released prior to 15 Dec 1961.

LCDR Russell L. Stokke

LT Paul R. Francis

LT Haruo Kato

Robert M. Amaral, ADC

WELL DONE!

The contribution of some 4000 Navy officers and men to the Military Air Transport System, a command run by the Air Force for the Department of Defense, is little known.

Air Force Commendation medals were earned by LCDR Russell L. Stokke, and LT Paul R. Francis, LT Haruo Kato and Robert M. Amaral, ADC, all of VR-7.

The men were the crew of a *Super Constellation* that departed Japan on 16 June enroute to Hawaii with a fuel stop at Midway Island. As the flight approached Midway, they were warned of a large storm with accompanying heavy rains also bearing down on the small island.

Thick black clouds, lightning and torrential downpour, won the race to the island and the Moffett Field *Connie* was forced to hold over the airdrome, since no other normal landing field was within its range.

The next two and a half hours were busy ones for the men in the cockpit. With LCDR Stokke flying the plane, LT Francis handling the radio, LT Kato monitoring the rapidly diminishing fuel and Chief Amaral nursing the engines, the aircraft alternately held over the island and made approach after approach to the airstrip.

Each time they descended, however, the Ground Control Approach operator would either call, "Your aircraft lost in the rain on the radar scope, wave off," or "your aircraft now at minimum safe altitude, take over visually," and LT Francis would have to say, "Wave off, field NOT in sight."

Two hours after arriving over Midway and after four unsuccessful approaches, the fuel situation was becoming critical. Meteorologists predicted the freakstorm would hover over the island for the next two to three hours.

It was then that LCDR Stokke made the decision that probably saved the lives of many of the 76 passengers and 8 crewmen aboard the plane. The only other remotely possible landing strip that could be reached with the small amount of fuel remaining was a tiny coral atoll marked "Kure Island" on some charts and missing from most others.

There was no information about the island in any of the flight information publications, no approach aids, but LCDR Stokke, a veteran pilot of 20 years experience knew that smaller planes sometimes landed there taking supplies to a Coast Guard detachment. He had also noticed the island, 50 miles west, had been clear of the storm two hours earlier. A weather check with Midway showed the storm had yet to hit Kure, but it was getting closer all the time. He immediately requested a radar vector to Kure, and in a few minutes the plane broke into the clear with Kure just ahead. The plane started a low pass to have a looksee at the short undeveloped coral strip. As it neared the end of the runway the heavy rains started pounding on the other end of the mile wide island. "Gear Down," called LCDR Stokke and moments later the *Connie* had safely returned to earth while the storm raged over the island.

Letters of commendation and congratulations for a job well done have been arriving for LCDR Stokke and his crew from top Navy Admirals and Air Force Generals since the emergency occurred. The one letter that probably meant the most to the crewmembers was the one that was signed by each of the 76 men, women and children that were passengers aboard the plane. It said, "Thanks for saving our lives." ●

Commanding Officers' attention is called to SecNav Inst 1650.16 of May 1961 regarding Secretary of the Navy Commendation for Achievement Award. Purpose of the award is to provide suitable recognition for junior officers and enlisted personnel whose professional achievements clearly exceed that which is normally required or expected . . . .

THE PHYSICAL FITNESS PROGRAM

SEE PAGE 14